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METROPOLITAN DISTRICT COMMISSION



ANNUAL
REPORT

FISCAL YEAR
ENDING
JUNE 30, 1976

GOV DOC
6457
.34
1976

DISTRICT MEMBERSHIP

	Water	Parks	Sewerage		Water	Parks	Sewerage
Arlington	x	x	x	Revere	x	x	x
Ashland			x	Saugus	x	x	
Belmont	x	x	x	Somerville	x	x	x
*Bedford			x	Stoneham	x	x	x
Boston	x	x	x	Stoughton			x
Braintree		x	x	Swampscott	x	x	
Brookline	x	x	x	Wakefield	x	x	x
Burlington			x	Walpole			x
Cambridge	x	x	x	Waltham	x	x	x
Canton	x	x	x	Watertown	x	x	x
Chelsea	x	x	x	**Wellesley	x	x	x
Cohasset		x		Weston	x	x	
Dedham		x	x	Westwood		x	x
Dover		x		Weymouth		x	x
Everett	x	x	x	Wilmington			x
Framingham			x	Winchester	x	x	x
Hingham		x	x	Winthrop	x	x	x
*Holbrook			x	**Woburn	x		x
Hull		x			<u>x</u>	<u></u>	<u>x</u>
Lexington	x		x	Totals	34	37	43
Lynn		x					
Lynnfield Water Dist.	x						
Malden	x	x	x				
Marblehead	x						
Medford	x	x	x				
Melrose	x	x	x				
Milton	x	x	x				
Nahant	x	x					
Natick			x				
Needham	x	x	x				
Newton	x	x	x				
Norwood	x		x				
Peabody	x						
Quincy	x	x	x				
Randolph			x				
Reading			x				

(Beyond the Water District the MDC furnishes the entire water supply for Chicopee, South Hadley Fire District No. 1 and Wilbraham, a partial supply to Clinton, Framingham, Leominster, Marlboro, Northboro and Southboro and an emergency standby connection for Worcester.)

Membership

3 Districts	24
2 Districts	12
1 District	<u>18</u>
	54

*Bedford joined the Sewerage District in June, 1970, with sewage for part of the town handled through the town of Lexington under special contract. Holbrook became a member of Sewerage District in January, 1971, but is not contributing sewage to the system.

**Woburn was admitted to Water District in August, 1972, and Wellesley in March, 1974, but neither is being supplied pending completion of connections.

MICHAEL S. DUKAKIS
Governor

EVELYN F. MURPHY
Secretary of Environmental Affairs

JOHN F. SNEDEKER
Commissioner

Associate Commissioners
ANITA B. BANKS
PETER D. CORBETT
MARIANNA D. HANNIGAN
CONCHITA F. RODRIGUEZ

JOHN A. KESSLER, JR.
Secretary of the Commission

MARTIN F. COSGROVE
Chief Engineer

Executive Assistants
JOHN J. BEADES
JAMES T. O'DONNELL

JOHN WRIGHT
General Counsel

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DIVISION DIRECTORS

FRANCIS T. BERGIN
Chief Construction Engineer
Engineering Division

LAURENCE J. CARPENTER
Superintendent of Police

ALFRED F. FERULLO
Director of Environmental Quality

ALLISON C. HAYES
Director of Sewerage Division
Chief Sewerage Engineer

WILLIAM T. KENNEY
Director of Central Services

JAMES J. MATERA
Director of Water Division
Chief Water Supply Engineer

JULIA B. O'BRIEN
Director of Land Planning

MARTIN WEISS
Director of Environmental Planning

ROBERT B. WILLIAMS
Director of Parks and Recreation

(Incumbents as of 6/30/76)



The Commonwealth of Massachusetts
Metropolitan District Commission
20 Somerset Street, Boston 02108

To His Excellency the Governor and the Secretary of Environmental Affairs:
To the Honorable Senate and House of Representatives:
To the Honorable Mayors, Selectmen and Municipal Officials:
To the Public of the Metropolitan Parks, Sewer and Water Districts:

The Metropolitan District Commission submits herewith a report on activities and other pertinent data for the fiscal year ending June 30, 1976, in accordance with the provisions of Section 100, Chapter 92 of the General Laws.

This document is designed to provide a broad overview of MDC's accomplishments during fiscal 1976 and plans for the near future in providing vital regional services for nearly 2.5 million inhabitants of 54 cities and towns.

It has been a productive year. The parks system's facilities, open space and recreation programs are expanding to offer greater opportunities for wholesome activity. Water supply of high quality is dependably meeting existing needs, although new sources are required to meet growing demands. Significant progress in pollution control is being achieved, while a long-range program has been developed to meet new clean-water goals. Our police force has risen to the challenge of traffic problems, crime incidence and protection of widespread MDC property. Despite a substantial increase in these activities, there has been a reduction in debt, personnel and maintenance and operation costs.

It is our hope that this report will bring greater understanding of MDC's efforts to satisfy basic needs, meet environmental goals and enhance the quality of urban life efficiently and economically.

Respectfully submitted,

A handwritten signature in black ink that reads "John F. Snedeker". The signature is written in a cursive style with a large, stylized "J" and "S".

John F. Snedeker
Commissioner

Highlights of the Year's Activity

Significant progress in developing regional facilities and services for improving the quality of life was accomplished by the Metropolitan District Commission during the fiscal year ending June 30, 1976.

The wide-ranging programs affect 2,431,968 inhabitants of 54 cities and towns in Metropolitan Boston served by one or more of the three MDC districts — Parks, Water and Sewerage.

Extensive development of the parks system is well on its way, highlighted by a construction start on a new 200-acre park reservation on the Mystic River Basin. Planning is proceeding for a one-mile oceanfront park and rejuvenation of Revere Beach, developing a Belle Isle Reservation in East Boston and an urban park on the grounds of Chestnut Hill Reservoir in Brighton. Major renovation and development is progressing at Stony Brook Reservation in West Roxbury and Hyde Park and along Quincy Shore Drive at Wollaston Beach Reservation. Work has begun on restoring historic Fort Independence at Castle Island, South Boston, while improvements are continuing on MDC's Boston Harbor islands. Funding problems have delayed first phase construction of a Metropolitan Arena and Recreation Center, incorporating an indoor schoolboy track and a park on the Neponset River shoreline in Dorchester, and a new innovative, year-round Franklin Park Zoo. MDC's historic and park facilities were heavily involved in Bicentennial events, particularly a July 4th patriotic concert and fireworks display at Hatch Shell attended by 400,000. Recreation activity has been broadened by newly-developed opportunities for canoeing, cross-country skiing, sailing and tennis.

For the first time in 15 years MDC's primary water source at Quabbin Reservoir was filled on January 28, following substantial above-average precipitation in the past four years. But the need for new sources remained critical as rainfall dropped a half-inch below average in 1976 and Quabbin diminished to 98% of capacity by June 30. Meanwhile, the district's consumption in excess of safe watershed yield has increased and a number of additional communities are looking hopefully to MDC for water supply. The situation heightened the need for the long-delayed diversion of excess freshet flow of Connecticut River to feed Quabbin. Major extensions of the water system to the north and south of Boston, as authorized by legislation, are in various stages of progress. This affects 12 communities where needs are either pressing or anticipated in five to 15 years. A pilot plant has been activated for feeding an approved zinc compound in an attempt to correct the lead problem in water caused by lead pipes in older local water systems. Construction of a fluoridation facility is scheduled to start in a few months to alleviate tooth decay.

A newly-completed inter-agency study of wastewater management in the Boston Harbor-Eastern Massachusetts Metropolitan Area (EMMA) has launched the biggest pollution control program in MDC history. Recommendations to meet long-range clean-waters requirements stretching into the next century are in the early stages of implementation. The \$855 million cost will be met by Federal, State and MDC funds. Other pollution control projects underway or imminent include sludge disposal, harbor tidegate rehabilitation and sewer interceptor pipelines to enlarge the system's capacity. An ongoing construction program in Charles River's lower basin provides for a storm detention-chlorination facility, a pumping station and major conduits. Treated combined storm overflows will be discharged below the new Charles River dam, presently under construction.

A new dimension has been added to efforts by Metropolitan District Police in alleviating peak hour tieups on Central Artery and Southeast Expressway and consequent traffic overflows into other roadways. Radio-equipped tow trucks operated by MDC's Central Services Division have teamed up with police aerial spotting of breakdowns and accidents for rapid removal of disabled vehicles. In its first four months operation there were 1587 responses by emergency units. Crowd control at heavily-attended Bicentennial celebrations posed a big challenge, as well as mobilization for emergency assistance to other agencies. There was heavy involvement, too, in Boston's Phase 2 school desegregation program early in the school year.

A major crisis created by an unprecedented three-day strike of state employees was met with minimal impact on vital operations, although most recreation facilities were shut down. With absenteeism ranging from 61% to 69% of the department's employees, many supervisory and other non-striking personnel worked around the clock or on extensive voluntary overtime duty to maintain essential operations. MDC Police provided protection in maintaining these vital services.

MDC membership now consists of 43 cities and towns with 2,180,074 residents in the Sewerage District, 34 communities and 1,836,240 residents in the Water District and 37 municipalities with 1,984,940 population in the Parks District. Twenty-four municipalities are members of all three districts, 12 are served by two districts and 18 by one district.

Expenditures for fiscal 1976 were \$47,496,147 for maintenance and operations, down \$386,523 from 1975, and \$26,812,727 for debt payment, up \$2,136,436. An additional \$3,014,692 was expended for highway projects funded by state highway bond issues and state-financed flood control work, which do not reflect in assessments on MDC cities and towns.

Tight Water Supply Causing Concern

Fresh signs of the anticipated crunch on MDC's water supply emerged during 1976, heightening the need for implementing plans for new sources, particularly the long-delayed diversion of excess freshet flow of Connecticut River to feed Quabbin Reservoir.

The urgency was felt as an outgrowth of increased consumption in excess of the system's safe yield, below average rainfall in 1976 and a growing need for water by communities outside the present water district.

Ironically, the outlook took this turn after MDC's primary water source at Quabbin Reservoir overflowed on January 28 for the first time in 15 years, bolstered by a total of 33.3 inches above-average precipitation in the 1972-75 period. By June 30 the reservoir had fallen to 98% of capacity or one foot below full elevation, foreshadowing a trend downward. In 1976, rainfall dropped a half-inch below average, the first sub-normal year since 1971. Engineers have long felt that Quabbin's level cannot be supported even by normal precipitation. An analysis has shown that a recurrence of the six-year drought of the '60s, which reduced Quabbin to 45% of capacity, would drop the level to 31% based on current consumption.

A reversal of the four-year downward trend of consumption has intensified the pressure for augmenting the system's average safe yield of 300 million gallons per day (mgd). The record high use of 321.6 mgd in 1971 gradually diminished to 312 mgd by 1974, due to reduced summertime demand during three wet years, but the figure has now risen to 316.6 mgd. An all-time high for a single day's consumption was set on Aug. 1, 1975, when 434.9 mg were delivered through MDC pipes.

Additional Communities Seek Water

Meanwhile, four Metropolitan Boston communities with supply problems — Bedford, North Reading, Lynnfield Center and Stoughton — have either applied for membership in the Water District as partial users or entered the discussion stage. Additionally, Woburn and Wellesley, admitted to the district in recent years as partial users, will be drawing water upon completion of connection facilities. In Western Massachusetts the hard-pressed towns of Amherst and Hadley and the University of Massachusetts, all located in the Quabbin area, were offered up to five mgd of MDC water, simply as an alternative if no other sources can be found. Several other towns in this vicinity also are looking to MDC as a possible solution to their needs.

For the past decade, MDC planners have regarded the Connecticut River diversion as the most effective, environmen-



Jack Maley, MDC

QUABBIN RESERVOIR OVERFLOWED for the first time in 15 years on January 28, following four years of above-normal precipitation. Water level fell during 1976, due to slightly below average rainfall. A six-year drought in the '60s reduced Quabbin to 45% of capacity.

tally-sound answer to the water problem facing 34 cities and towns in the Metropolitan Water District, 10 others to the west served under special agreements and other communities requiring water to supplement local sources in the future.

Connecticut River Diversion

Planning has been well advanced for facilities to flood-skim about 1% of the river's excess flow during the spring flood season — otherwise wasted to the ocean — to augment the Water District's principal source at Quabbin Reservoir. State legislation limits the diversion to 375 mgd and only when the flow is 17,000 cubic feet per second at Montague, Mass. A Special Legislative Study Commission has reported that data shows "the projected total water needs of the Con-



Jack Maley, MDC

QUABBIN RESERVOIR, as shown in a recent aerial photo, stretches 18 miles in length and provides most of the Water District's supply. An unspoiled wilderness setting has been retained in its surrounding wide-ranging forests, hills and islands.

necticut River Valley, including water supply, recreation, navigation, fish and wildlife, cooling and water quality, can be amply met by a river flow of 10,000 cubic feet per second at Thompsonville, Conn.'" and that "a corresponding flow at Montague, Mass. would be considerably less than 10,000 cubic feet per second.'" The surplus water would bolster MDC's annual supply by an average of 72 mgd or 26.3 billion gallons a year — nearly 25% of the current safe yield.

The plan calls for a 10-mile aqueduct between Quabbin and the Northfield Mt. pumped storage reservoir built by Northeast Utilities for hydro-electric power production, with additional capacity for the proposed diversion. Estimated timetable for completion of the aqueduct connection is seven years. The project has been delayed by negotiations with Northeast Utilities and still faces resistance from river valley groups and officials of the State of Connecticut, including a threat of litigation.

Long-Range Studies Proceeding

The full scope of state water resources and management is now under study by the Executive Office of Environmental Affairs. Its recommendations will provide a broad perspective, including supply, proposed inter-basin transfer of river water, conservation techniques, environmental, economic and recreational aspects and MDC's role in satisfying the state's needs. A final report is scheduled for early 1977.

Other studies of various facets of the MDC system have been completed or still in progress, looking ahead at least 50

years. The MDC program deals with new sources, upgrading and expanding the system and examination of water use, with emphasis on reducing waste by developing conservation methods and reducing leakage loss in municipal distribution systems. The latest study report on water transmission and distribution has produced a computer model and recommendations for a \$30 million improvement program extending to 1990. Preliminary findings in a draft report have encouraged proposed expansion of MDC's use of the Sudbury River watershed by flood-skimming and treating freshet flows, but final conclusions await further study of the controversial proposal. A number of conservation proposals have emanated from still another report.

The necessity of upgrading old water mains in the MDC system was underlined when a century-old, 48-inch main in Brookline burst on September 2, causing flooding damage to the MBTA's Riverside line, town recreation facilities, 49 apartment house tenants and owners, a business firm and a church.

Major water system extensions to the north and south of Boston are in various stages of progress, affecting 12 communities where needs are either pressing in some cases or anticipated within five to 15 years.

To the north a \$1.4 million pipeline has been completed between Woburn, a new Water District member with water problems, and the westerly shore of Spot Pond Reservoir in Stoneham. Still required to link Woburn with the MDC system are a one-mile, \$1.2 million connection running beneath the

Quabbin Comes to Rescue In Ware River Flood Threat

Quabbin Reservoir was pressed into service for flood control purposes for several days in early 1976, when five towns along the Ware River were threatened with flooding.

MDC diverted 580 million gallons per day via a 12-mile tunnel linking the Ware River intake at Colbrook with the reservoir. Towns in the affected area were Ware, Barre, Hardwick, Gilbertville and Palmer. The Ware River watershed provides a limited water supply for Quabbin. The emergency was caused by melting snow, heavy rain of the January thaw and ice jams.

reservoir to the existing Spot Pond pumping station and a further pipeline extension of 9400 feet in Woburn. This project was designed with sufficient capacity for eventual extensions to Reading and North Reading, both potential members with supply problems. It would also provide capacity for an additional pipeline to supplement flow and boost pressure for Stoneham and Wakefield, present members of the Water District. A \$5.3 million legislative authorization is being sought to complete these extensions as well as a proposed standpipe on Bear Hill in Middlesex Fells Reservation with a connection to the Woburn pipeline. Structural repairs of extensive fire damage at the Spot Pond pumping station in 1975 have been nearly completed under a \$234,400 contract. New pumps and equipment rehabilitation are under design to provide pressure and volume for the Woburn pipeline.

A construction start on facilities to serve seven communities south of Boston has been delayed until at least 1977 by a requirement of the Executive Office of Environmental Affairs for a complete environmental impact report, following an environmental assessment submitted in April. Opposition also has developed from some local groups against the proposed pipeline route through Blue Hills Reservation.

The \$17 million program, authorized by 1974 funding legislation, will provide service to six potential members, Avon, Braintree, Holbrook, Randolph, Stoughton and Weymouth, and provide an additional supply to Canton, presently a partial user member. Stoughton has already faced a water crisis in 1976, while studies indicated other communities will require a supplementary source within five to 15 years. A threatened moratorium on construction of multi-family housing was averted by MDC action in allowing Canton to share a portion of its MDC allotment of three mgd with Stoughton. The project calls for 15 miles of new water mains and a pumping station in the Randolph section of Blue Hills, with Blue Hills Reservoir serving as a major distribution facility.

The way was cleared for the southern extension by activation of the huge \$19 million Dorchester Tunnel in 1975. The 10-foot diameter tunnel with 300 mgd capacity runs 6½ miles

Stable Water Rate Promising Under Pay-As-You-Go System

For the second successive year, MDC has set a rate of \$240 per million gallons in 1976 for the 34-member Water District, with a good prospect that the figure can be maintained in 1977.

As further assurance of a stabilized rate sought by MDC and district members, legislation will be filed to establish a Water Stabilization Reserve up to \$3 million from surplus water income. The proposed reserve is aimed at offsetting future deficits and averting fluctuating rates.

Legislation authorized a shift in 1974 from costly long-term financing of deficits to a pay-as-you-go policy, resulting in the first rate increase in 12 years. The \$120 rate set by the Legislature in 1962 rose to \$200 in 1974 and to \$240 in 1975 to equalize receipts with cost of debt and operation and to wipe out deficit borrowing. The deficit financing system has required \$110 million in bond issues, \$56.5 million of which is currently outstanding. This indebtedness is now being constantly reduced under the pay-as-you-go policy.

from Chestnut Hill at the Brighton-Brookline line to Dorchester Lower Mills. It was designed to boost pressure and supply for a large area of Boston and Brookline and for Quincy, Milton, Canton and Norwood. An inspection of a tunnel section in Dorchester to check on a possible leak is being planned, following recent complaints of water seepage from some nearby residents.

A pilot plant facility went into operation in June to attempt to solve problems associated with outmoded lead service pipes used in older local water systems. An approved zinc compound is added to the water to offset the corrosive effect of MDC's soft water in lead pipes. Action was taken following sampling in Boston, Somerville and Cambridge households indicating lead content of drinking water in excess of Federal standards. The U.S. Environmental Protection Agency reported, however, that the problem was not with MDC water, described as "one of the finest serving an urban area anywhere in the country."

Construction of a \$753,000 fluoridation plant is scheduled to start in a few months, with completion due in the fall of 1977. Anti-corrosion and fluoridation will be combined at the Southboro shaft linked with the tunnel system carrying water to the district from Quabbin and Wachusett reservoirs. Fluoridation is expected to save upwards of \$7 million annually for persons under the age of 20 by reducing tooth decay, according to an estimate by Massachusetts Dental Society. Its use on a district-wide basis will provide savings, too, for member communities which are planning or already have installed local fluoridation systems.

Report Proposes Huge Clean Water Program

A wide-ranging blue print for pollution control in Boston Harbor and tributaries and substantial progress on major projects affecting the Charles River basin featured MDC's clean waters activity during 1976.

An intensive, inter-agency study in the Boston Harbor-Eastern Massachusetts Metropolitan Area (EMMA) has recommended an unprecedented, long-range program costing \$855 million at 1975 prices, funded 75% by Federal grants, 15% from state funds and 10% by members of MDC's Sewerage District.

The projects, designed to make Boston Harbor one of the cleanest metropolitan waters in the East, provide for alleviating combined stormwater-sewage overflows, particularly affecting Dorchester Bay and Charles River (\$270 million); expanding primary treatment at Deer Island and Nut Island treatment plants (\$92.5 million); upgrading the two plants from primary to secondary treatment as required by Federal law (\$236.7 million); sludge disposal facilities for primary treatment (\$26 million); additional facilities for secondary sludge management (\$28 million) and interceptors and pumping stations (\$111 million).

Inland Treatment Plants Proposed

A significant new approach was a recommendation for two inland treatment plants costing \$90.7 million, which would discharge highly-treated effluent into the middle reaches of the Charles River and the upper Neponset River. These "satellite" plants would relieve the hard-pressed Nut Island treatment facility and also provide reclaimed clean water to augment badly-needed river flow during dry weather periods.

Concern over the site selection and environmental impact of the Charles River plant has come from residents in the Needham-Wellesley-Natick-Dover area. Quincy citizens have expressed fear of an adverse impact on nearby waters from expanding the Nut Island plant for secondary treatment, requiring filling of 26 acres of Quincy Bay. However, a proposed change in Federal law to modify the requirement for secondary treatment for effluent discharged in ocean waters is pending in Congress. As an alternative, outfalls serving Deer Island and Nut Island would be extended further into deep water.

Other phases of the EMMA report, completed in March, 1976, recommended MDC as the appropriate management agency for building, operating and maintaining the proposed wastewater facilities and expansion of the Metropolitan Sewerage District from 43 communities to 51.

Approval of the EMMA construction schedule by the U.S. Environmental Protection Agency and MDC and finalized agreements with EPA are expected shortly. Legislation has been filed to finance the planning and design phase of the

Vital Services Maintained In Strike Crisis Struggle

The spectre of raw sewage pouring into waterways or backed up into residential areas, disruption of water supply and a health menace faced worried MDC officials in a major crisis posed by an unprecedented strike of state employees on June 21-23.

But the illegal walkout had minimal impact on essential public services — thanks to emergency planning and sleepless nights by dedicated supervisors and other non-striking personnel. Hundreds worked round-the-clock or voluntarily struggled through long overtime hours to prevent a breakdown of vital water distribution and sewerage operations. Some never left their post of duty during the three-day emergency.

Absenteeism by the department's employees ranged from 61% to 69% during the strike, following a breakdown in union contract negotiations.

Sewage was by-passed into Quincy Bay at the Nut Island treatment plant with only chlorine disinfection for a single eight-hour shift, into Nashua River at a treatment plant in Clinton for 12 hours and backed up briefly into Charles River due to a shutdown of a Roxbury headworks installation. But cooperative efforts by MDC management and union officials restored service in recognition of the health hazard. Beaches and swimming pools were officially closed for lack of lifeguards and maintenance workers, along with zoos, golf courses and most other recreation facilities.

MDC Police stationed at 71 individual facilities and at picket lines succeeded in averting major incidents, vandalism or damage to property.

program. Still ahead also are environmental assessment or impact statements required for each of the proposed projects and infiltration/inflow studies concerning reduction of ground-water seepage into sewer lines and inflow from illegal sewer connections.

In the Charles River Basin, an ongoing improvement program made big gains toward clean water goals aimed at enhancing enjoyment of passive recreation, boating and fishing.

A major pollution source — overflows of combined stormwater and sewage — is being combatted by building large-capacity interceptor sewer lines and treatment facilities

New Sewer Use Charge Faces District Members

Facing the 43 communities in the Sewerage District is a new system of local sewer use charges and revised MDC assessments required by recent state legislation. The measure was enacted to establish eligibility for Federal and State grants to MDC for sewage treatment works and also for local treatment projects. The Federal Water Pollution Control Act of 1972 stipulates that recipients of grants adopt a user charge, an industrial capital cost recovery program and a sewer ordinance regulating the type of sewage entering local systems. Implementation of these provisions will qualify MDC for grants estimated at \$765 million, largely for the proposed \$855 million wastewater program recommended by the EMMA study.

For households the user charge is expected to be related to water consumption, a method generally in effect by communities presently imposing this type of charge. Industries would be subject to a formula considering strength, volume and other characteristics of waste. Sewer use costs will be billed separately and no longer reflected in the property tax rate.

MDC's assessment for member communities covering operation and maintenance costs will be based on residential population served by the system and a "population equivalent" formula for contributing industries, commercial establishments and other users. This expense is now assessed on the basis of total population. MDC debt requirements will be assessed on total population and the population equivalents formula instead of capacity of municipal sewers connected to the MDC sewerage system. The new law applying to debt assessments is effective in 1976 and for operations and maintenance in 1977. Sewer use charges and industrial cost recovery will become effective when treatment projects eligible for grants are completed.

Charles River Basin Improvements Underway

Construction began in 1976 on the \$22 million Charles River Marginal Conduit Project designed to alleviate pollution in the lower basin. The facilities will also eliminate pollutant overflows in the one-half mile expansion of the basin created by the new \$35 million Charles River Dam currently under construction near the Boston & Maine Railroad's North Station.

By early 1977, work is scheduled to start on a storm detention and chlorination plant and pumping station on the East Cambridge shoreline at a cost of \$12.3 million. The first \$3.6 million phase was underway in the fall of 1975, calling for an eight-foot-diameter force main to discharge treated

effluent from the projected storm detention-chlorination station into the harbor below the new dam, regardless of tide level. Another 18-inch force main will carry screenings and sanitary sewage from the station to the Charlestown interceptor for treatment at Deer Island. A newly-awarded \$4.8 million contract provides for large interceptor sewers for diverting overflows from Boston, Cambridge and Somerville marginal conduits to the detention-treatment station. Federal funds will cover 75% of the cost, the state 15% and the Sewerage District 10%.

Completion of the new Charles River Dam by early 1978 will greatly reduce another serious pollution source — salt water intrusion into the basin flowing through the boat lock at the existing dam built in 1908, particularly during heavy summer marine traffic. Because it is heavier than fresh water, the saline layer, devoid of oxygen and highly polluted, remains in stratified form on the basin bottom. This prevents vertical mixing and aeration, stifles fish and plant life and produces hydrogen sulfide gas odors at times. A preliminary study report proposed a destratification technique, utilizing compressed air discharged through air diffusers in strategic deep portions of the basin. The \$600,000 system would insure the presence of oxygen throughout the water column, eliminate the threat of odors and fishkills from any future influx of salt water and provide a better environment for fish.

Upriver, a final contract amounting to \$3,655,000 has been awarded to complete a key North Charles interceptor in Cambridge at a total cost of \$16.8 million. The four-phased program containing pipes as big as 8½ feet in diameter stretches three miles from Main Street to the vicinity of Mt. Auburn Hospital. The new interceptor supplements 20 miles of relief sewers built on the South Charles in recent years.

The interceptors on both shorelines were designed to enlarge existing capacity carrying wastewater to Deer Island for treatment and tie in with the five-year-old Cottage Farm Stormwater Treatment Station in Cambridge, near B.U. Bridge. This innovative facility is similar to the storm detention-chlorination station to be built in the lower basin as part of the Charles River Marginal Conduit Project.

During storms, the Cottage Farm prototype plant intercepts and treats overflows of combined sewage and stormwater from 26 discharge points on both banks of the basin. The process provides for screening, settling and chlorination before discharging effluent from holding tanks into the river and the disposal of pollutant solids into sewer lines for treatment at Deer Island. In 1976 the plant was activated 73 times during storms, 21 of which were entirely contained by the facility with no discharge to the river. A total of 991 million gallons was diverted to the station for processing.

The cleanup of Charles River waters will significantly supplement current activity on upgrading the quality of Boston Harbor waters.

An important harbor program — rehabilitation of more than 100 defective tidegates to alleviate pollution and prevent salt water intrusion into the sewerage system — is scheduled for completion next year at a cost of \$1.1 million. The faulty



Jack Maley, MDC

FLOOD CONTROL pumping station is near completion at Amelia Earhart Dam, below confluence of Mystic and Malden rivers. The installation (at right) has a capacity of nearly two million gallons per minute. Three locks and control tower (left) serve as gateway between Boston Harbor and the rivers, accommodating nearly 14,000 boat passages annually.



Jack Maley, MDC

NEW CHARLES RIVER DAM is under construction, aimed at completion by early 1978. The 1200-foot facility will contain a flood control pumping station, three navigation locks, a police patrol boat building, fishway for up-river access and a walkway viewing area. It will also enlarge the river basin by 30 acres and minimize intrusion of pollutant salt water.

tidegates in the Boston main drainage system and Chelsea have allowed sea water to flow into sewers, causing flushing of sewage into the harbor on tide cycles and intrusion of corrosive salt water into sewer lines leading to Deer Island treatment plant. The salt water reduction has already improved plant operation and maintenance as well as production of methane gas for energy use.

In another facet of the harbor problem, an MDC plan to incinerate sludge from the primary treatment process at Deer Island and Nut Island plants has been supported by an impact study of the Environmental Protection Agency. The draft report concurred that incineration would be the most environmentally acceptable disposal method, but concluded that the ash should be hauled to an off-site sanitary landfill for disposal instead of in a man-made lagoon adjacent to Deer Island.

At Deer Island, a two-year experiment has begun to test a unique high energy electron irradiation method of disinfecting sludge and wastewater. The two-year pilot program is jointly financed by MDC, National Science Foundation and State Division of Water Pollution Control, and is being operated by MIT and High Voltage Engineering Corp.

Design work and inflow/infiltration analyses are proceeding on three sewerage projects totaling \$11.8 million. These are (1) expansion of the Reading pumping station and increasing the capacity of sewer lines serving Reading, Stoneham and Wakefield by 14 million gallons per day (mgd) at a cost of \$3 million; (2) a relief sewer accommodating 2.5 mgd additional flow to relieve an overloaded line serving sections of Brookline, Newton and West Roxbury, \$5.4 million; (3) increasing the capacity of the sewer line siphon under Weymouth-Fore River for projected peak flows up to 63 mgd from Braintree, Randolph and Weymouth.

In a continuous program of weed control, five fresh water areas were chemically treated in 1976 to provide maximum recreational benefits for swimming, boating or fishing. The locations were at St. Moritz Pond and Ponkapoag Pond in Blue Hills Reservation, Pearce Lake at Breakheart Reservation and the Upper and Lower Mystic lakes.

An industrial waste survey initiated in 1974 on a pilot basis to determine adherence to MDC and Federal requirements has been expanded to all 43 communities in the Sewerage District. Inspections have been completed in 11 communities involving 1045 industries. Eighty-five were found to be in violation of MDC rules and regulations and are presently pretreating, implementing pretreatment and/or modifying their systems to comply with standards.

Emergency efforts by Sewerage Division personnel succeeded in restoring sewage treatment at the Nut Island plant after an 11-hour disruption in January due to failure of power generators. Backups in the system were averted by bypassing raw sewage into Quincy Bay until emergency generating units were installed. The plant's equipment had been under a severe burden caused by heavy flows of stormwater into the sewerage system. During the past year nearly \$1 million has been spent or committed to upgrade operating efficiency of the 25-year-old plant.

Flood Control Projects

Flood control work in progress, in addition to the new Charles River Dam, was highlighted by a \$5.9 million pumping station at the Amelia Earhart Dam, just below the confluence of the Mystic and Malden rivers. The installation, scheduled for completion in the fall of 1976, is designed to enlarge the

Unique Twists, Large Turnout In Volunteer Spring Cleanup

There were some new twists and scores of involuntary workers among the thousands of volunteers involved in the 1976 spring cleanup of MDC parks and reservations.

On a 35-mile stretch of the Charles River tackled by 1000 volunteers, a National Guard helicopter was utilized for the first time, swooping low to direct workers by radio to especially littered areas. New to the cleanup operation, too, were an armada of seven MDC police boats, two amphibious "ducks" for scouring the river surface and scuba divers to clear submerged debris. On shore, MDC, National Guard and municipal vehicles hauled away nearly 150 tons of trash. Two police buses transported volunteers to work areas.

A surprise discovery turned up in the massive cleanup at Middlesex Fells Reservation — a cache of weapons, including a shotgun, three handguns, ammunition and two knives. About 1000 volunteers gathered 110 tons of debris, ranging from endless beer cans to a rowboat with a hole and refrigerators. Among the participating community groups were Friends of Middlesex Fells, a college fraternity from MIT and social studies students from Medford High School who received academic credit for participation.

More than 100 teenagers and young adults became involuntary workers, cleaning up beer cans and other trash at Nahant Beach as a penalty imposed in Lynn District Court for violating an MDC regulation against drinking alcoholic beverages on beaches.

At Revere Beach, a disconcerting contrast in attitudes marked a cleanup by Revere High School students. While 600 bags of trash awaited pickup on the following day, vandals tore apart many of the bags, leaving behind a trail of scattered rubbish.

A full-scale operation at Blue Hills Reservation drew 1200 volunteers and produced 60 truckloads of trash.

dam's capacity to cope with major storms, particularly for pumping during high tides. A fish ladder has been incorporated to facilitate passage of anadromous fish to the river upstream from the dam.

A \$438,000 floodwater pumping station has been completed on Broad Sound Avenue, Revere, the scene of heavy damage in recent years from a combination of storms and high tides.

In Quincy, an \$827,000 project for dredging Black's



SKY VIEW from a National Guard helicopter enabled MDC Commissioner John F. Snedeker to direct annual spring cleanup of Charles River area by volunteers.

Creek off Quincy Shore Drive and flood control culvert work affecting Furnace Brook Parkway and Southern Artery areas is nearing completion. Benefits will include improved boating and other recreation.

A \$500,000 improvement program is scheduled for early 1977 on historic Mother Brook, the first canal dug in America by English settlers in 1640 to provide industrial power by water diversion into Mill Creek from the Charles River. The improvements in Boston and Dedham along a 1 ½-mile stretch of the 3 ½-mile waterway, which empties into Neponset River, are designed to protect built-up areas from flood damage and develop passive recreation, such as walkways, fishing and boating. The work consists of restoration of two ponds, dredging a portion of the brook, repairs to three dams and a general cleanup. In preparation for the project, nearly 21 acres of shoreline property have been acquired since 1969.

Disastrous flooding was averted in early February when a mammoth ice jam piled up at the Moody Street Dam in Waltham following a two-day quick thaw coupled with rain and then by severe cold. Quick action by MDC crews, cranes and Metropolitan Police amphibious craft broke up the jam and relieved upstream flooding. The sudden release of backed-up water then sent a heavy flow and huge ice chunks downstream, damaging some shorefront property. Observers concluded that the emergency measures prevented catastrophic flooding.

Expansion of Parks Facilities Progressing

The start of construction on a new 200-acre park reservation on the Mystic River Basin and progress toward other major extensions of the parks system were highlights of recreational development during the past year.

Steps were taken toward a one-mile oceanfront park and rejuvenation of Revere Beach in conjunction with a private redevelopment. A Belle Isle Reservation in East Boston was initiated and planning began for an urban park on the grounds of Chestnut Hill Reservoir in Brighton, designed to protect the water supply.

Although preparations have been completed, funding problems have delayed first phase construction of a Metropolitan Arena and Recreation Center, incorporating an indoor schoolboy track and a park on the Neponset River shoreline in Dorchester, and a new innovative, year-round Franklin Park Zoo.

Meanwhile, work progressed on extensive renovation and development of Stony Brook Reservation in West Roxbury and Hyde Park and along Quincy Shore Drive at Wollaston Beach Reservation. Enhancing the popular appeal of the Charles River were projects for expanding recreation and relaxation, while improvements continued on MDC's Boston Harbor islands and work began on restoring historic Fort Independence at Castle Island, South Boston.

Mystic River Park Underway

Construction began in March on the \$3.2 million first phase of a new scenic park reservation on the Mystic River Basin shoreline in Medford and Somerville, near Route 93 expressway, the Fellsway and Mystic Valley Parkway.

Described as MDC's most exciting open space project in many years, Mystic River Park will transform an estuary wasteland into a 200-acre panorama of park, marine and recreation facilities. The site borders a 525-acre fresh water basin converted from unsightly, odorless salt water tidal flats by the new Amelia Earhart Dam in 1966.

The initial phase extends along the Medford shoreline from the MBTA bridge near Earhart Dam to the Fellsway and then along Mystic Valley Parkway to the Hormel Stadium sports complex. Under development also will be an additional segment on the up-river side of the Hormel athletic complex and a stretch of Somerville riverfront between the MBTA bridge and the Fellsway.

The 100-acre first phase features parkland for passive recreation, an island wildlife sanctuary, a wetland wildlife conservation area and planting of 10,000 native trees and shrubs. Facilities will include a fishing pier, bicycle and foot paths, picnic tables, a lookout tower and parking. The up-river segment, adjacent to the Hormel complex, will contain four tennis courts and Little League and soccer fields. An MDC

Summer Program Performs Mammoth Housekeeping Job

It was a mammoth housekeeping job rarely seen on MDC property, thanks to 1100 teen-agers and young adults in a special 1976 program to create summer employment and three Youth Conservation Corps projects in wooded reservations.

Tackling a backlog of chores neglected for lack of personnel, the youthful work force applied 1700 gallons of paint over 125 miles of guard rails, fences and curbing, 200 cross-walks and hundreds of park benches. Grass was kept neatly trimmed, acres of overgrown brush cleared and 680 tons of debris removed. Watersheds and other water supply property were cleared of litter, brush and debris. Clerical and service tasks were absorbed. Approximately \$1 million was spent in supplementing the efforts of 300 seasonal maintenance workers. MDC officials were enthusiastic about the results.

Much-needed forestry work was undertaken at Breakheart, Middlesex Fells and Blue Hills reservations by 105 young men in a Youth Conservation Corps program. The projects were financed by Federal funds and aided by MDC supervision and equipment.

sailing pavilion and dock were completed in 1974 on the Somerville shore, near Route 93, along with an adjacent park.

The next stage provides for development of parkland on the west shore of the Malden River from its confluence with the Mystic, a boat launch and extension of the phase one bicycle and foot paths. Plans also call for a park and fishing pier on a small peninsula alongside Route 93 in Somerville

Revere Oceanfront Park Funded

Creation of a one-mile beachfront park and rejuvenation of Revere Beach have gained new impetus by legislation authorizing a \$5 million expenditure and acquisition of the blighted amusement area on the oceanfront

The beachfront park is an outgrowth of a major joint redevelopment plan in the Revere Beach area proposing a \$100 million private housing development set back from the beach-westerly of Ocean Avenue, a 2000-car garage at the Wonderland MBTA station and a new connector highway from Cutler Circle, near Northeast Expressway. Revere

The 100-foot-wide park site lies between Ocean Avenue and Revere Beach Boulevard and runs one mile from Shirley Avenue to Revere Street, incorporating the deteriorating amusement strip.

A provision of the newly-enacted legislation allows an exchange of an MDC parking area on the inland side, westerly of Ocean Avenue, for beachfront property acquired by the housing developer. MDC has agreed to the transaction "in principle" but terms are pending. The exchange enables MDC to build a landscaped park and pedestrian mall behind the beach seawall and provides a setback of apartment towers far enough to avoid casting shadows on the beach. Acquisition of additional property is also authorized.

Another provision creates an inter-agency Revere Beach Design Review Board, including City of Revere representation, to determine whether proposed site development plans are suited to Revere Beach characteristics. MDC planners have been working closely with the developer and other state agencies to safeguard and enhance public enjoyment of the heavily-used MDC recreation asset acquired in 1895 as the first publicly-owned beach in the country.

About 1 ½ miles south of Revere Beach, preliminary plans have been developed for a proposed 200-acre Belle Isle Reservation near Constitution Beach, East Boston, following acquisition of the 28-acre, former Suffolk Downs drive-in theater. This site's concept calls for a passive park containing open space for informal play, tree planting, park benches and picnic locations. Opening an existing closed channel to Belle Isle Creek and cutting a second channel will allow tidal flushing and create an island with connecting bridges. Transfer of 135 acres of the Belle Isle saltmarsh by Massport has been requested for expanding the reservation.

At Constitution Beach, a \$737,000 program for rehabilitation and improvements has been nearly one-half completed, with the final phase scheduled for 1977. The first two phases provided basketball and handball courts, floodlighting, benches, a children's play area, replacement of paving with green park space and miscellaneous work. The final stage calls for an addition to the skating rink, including team dressing rooms, showers, multi-use rooms and spectator seating, and two tennis courts and landscaping.

Urban Park at Chestnut Hill

An urban park plan at MDC's Chestnut Hill Reservoir has emerged from last year's controversy over pollution effects of encroachment by joggers, picnickers, swimmers and dogs, which resulted in barring the public from the distribution reservoir grounds in Brighton.

A \$2.9 million master plan has been prepared for a new Chestnut Hill Reservation complete with a 1.6-mile jogging path, as well as exterior work at the Chestnut Hill water supply pumping stations and reconstruction of two roadways within 17 ½-acres transferred from the City of Boston. A relocated fence around the reservoir will protect the water supply from people using the park. The project also provides for wooden



DEVELOPMENT of Boston Harbor Islands Park is progressing. Among latest improvements at MDC's Lovell's Island are interpretive nature trail, tree planting, fireplaces and camp sites.

benches, drinking fountains, a new playground near MDC's Cleveland Circle skating rink, lighting, bike paths, landscaping and upgrading the roadway drainage system to prevent runoff from entering the reservoir. The multi-purpose project will be financed by parks, water and highway funds.

Schoolboy Track Delayed

A financing complication has delayed construction of an indoor schoolboy track serving the Parks District, designed as the centerpiece of a \$7 million park and recreation center on the Neponset River shoreline in Dorchester, near Southeast Expressway.

The obstacle developed when the lowest bid of \$6.5 million for the track and other facilities planned as the first phase indicated that the entire complex, as mandated by legislation, would cost \$1.4 million more than the authorized \$6.9 million. The Commission then decided to seek legislation for repeal of a provision for an ice hockey forum, bringing costs into line with available funds and allowing the project to proceed.

First phase of the 45-acre, diversified recreation complex would consist of a multi-use indoor track structure, a service building, six lighted outdoor basketball courts, landscaping, roadways, lighting and parking.

The sprawling 74,250 square foot track structure will accommodate a complete range of competitive track events,



AN AUDITORIUM-CLASSROOM is under construction at Trailside Museum, as shown at left in artist's drawing. The barn-like structure was designed to blend with the museum's original colonial farmhouse to the right.

basketball, tennis, volley ball, badminton and handball. The service building will house lockers, concessions and rooms for exercise equipment and community gatherings.

Rounding out the complex, the second construction phase provides for lighted tennis courts, softball, soccer, bicycle paths, picnic areas, fishing piers, pleasure boat-launching ramp and various riverside improvements.

Stony Brook Reservation Projects

A major \$2.5 million renovation and development program is well advanced at the 470-acre Stony Brook Reservation in the heavily-populated West Roxbury-Hyde Park section of Boston. The improvements provide a wide variety of athletic, park and active and passive recreation facilities, and specially-designed areas for the handicapped and for the elderly.

The \$310,717 first phase has been newly completed in the Turtle Pond area, including two fishing piers, picnic grounds, improvement and expansion of the hiking and bicycle path system, two parking areas, planting of 480 trees and changes at the Turtle Pond-Enneking Parkway intersection.

Work has just begun on two contracts totaling \$1,171,527 for rehabilitation and new facilities at the adjoining Kelly and Gelewitz fields and at the Factory Hill playground. The Kelly fieldhouse is slated for enlargement and major repairs and the softball and baseball fields will be rebuilt and equipped with new bleachers and an irrigation system. An overlook park has been designed for the elderly as a viewing



Jack Maley, MDC

NEWEST SKATING RINK at projected waterfront park in Boston's North End offers harbor views from large window walls. The rink has been used occasionally for morning practice sessions by Boston Bruins who described it "as good as we have seen."

area, equipped with benches and game tables. A gazebo surrounded by a moat is being installed overlooking the play areas. Walkways, play equipment, benches and lighting will dress up Factory Hill playground and the entire area is being enhanced by planting of 730 trees. A new River Street athletic field and bleachers are also specified.

A newly-awarded \$307,664 contract provides for improving the trail system in Stony Brook's southern section, three lighted tennis courts at Smith's Field and picnic facilities at Rooney's Rock and Turtle Pond.

Work is scheduled to start in 1977 on a park maintenance structure estimated at \$350,000 and subsequently the John F. Thompson Center for the Handicapped. The latter will consist of a central building, nature trails with descriptive environmental exhibits in Braille, play and picnic areas and an outdoor classroom at an estimated cost of \$375,000.

A grant of approximately \$1 million by the U.S. Department of Interior's Bureau of Outdoor Recreation has been assured for Stony Brook development.

At the nearby five-acre park embracing Francis D. Martini Music Shell on Truman Highway, Hyde Park, a \$167,910 project has been completed, emphasizing restoration of the natural environment. The work provided for floodlighting, a natural grass amphitheater, extensive tree and shrub planting, relocation of two lighted tennis courts, a lighted basketball court, a new picnic area and lighting standards. An \$83,925 reimbursement has been granted by the Bureau of Outdoor Recreation.

In another Hyde Park development, a 1 1/2-acre wooded

tract on Dale Street has been converted to recreational purposes at a cost of \$139,893, equipped with two tennis courts, basketball standards, children's play area, pathways and lighting.

Charles River Basin Development

A continuous program of beautification, development and acquisition along the scenic Charles River Basin is expanding opportunities for recreation and relaxation.

Construction of the third phase of a projected bikeway system on both shores of the Charles from Watertown to Boston was begun at a cost of \$298,832. The project extends the Esplanade bikeway one mile along Soldiers Field Road, Boston, between B.U. and River Street bridges, equipped with overlooks, benches and landscaping. An interesting aspect is a wooden bridge swung out over the river on pilings beneath B.U. Bridge as a link to existing paths on the Esplanade. Missing links and improvements on the north side of the Charles were completed last year from Watertown to Boston. The 16-mile network presently available — widely used by joggers as well as recreation-minded and commuting bicyclists — will be expanded to a 25-mile network on both sides of the river. Two additional projects on the Boston side will improve the existing route from Science Museum through the Esplanade to B.U. Bridge and provide the final link from River Street Bridge to Watertown Square.

On the Cambridge shoreline, a major restoration and upgrading of the Magazine Beach recreation area has been completed. The \$254,112 contract stressed extensive landscaping, shade trees, a grass and tree-covered overlook of the river, earth forms simulating fortifications used in the Revolutionary War and removal of a bisecting roadway. Other features were installation of drinking fountains, picnic tables and play equipment, and reconstruction of two existing ball fields.

Off Soldiers Field Road, Brighton, work has been completed on the initial stage of structural renovations and improvements at Herter Park Center, formerly Metropolitan Boston Arts Center (MeBAC). Planning is proceeding on redesign of the structure's interior and renovation of the summer outdoor theater where the Publick Theater has been performing for six years. The Center, named in honor of the late Massachusetts Governor and U.S. Secretary of State, has been designated for environmental, cultural, recreational and educational uses. Among activities in the 1976 season were urban gardening demonstrations, ethnic cultural events, a music and theater performing arts series and various exhibits.

Preparations have begun to create a new riverfront park adjacent to Moody Street Dam in Waltham, where property on a 1.6-acre site has been acquired by eminent domain, along with 2.2 acres of the riverbed. A development plan for passive recreation provides for tree planting, landscaping, a lighting system, walkways, benches and a fish ladder affording a view of fish migration from the park. The acquisition is in line with MDC policy to acquire available shorefront land for conversion to green park space, a program strongly supported by the late



Jack Maley, MDC

SCENIC BIKEWAY along Charles River Basin is popular with joggers as well as recreation-minded and commuting bicyclists. A 16-mile network along both shorelines presently completed is being expanded to 25 miles running between Boston and Watertown.

Representative Richard E. Landry of Waltham, for whom the park will be named.

Improvements at Wollaston Reservation

For the populous area south of Boston significant recreation projects have been completed or in progress, highlighted by a \$2.7 million, multi-purpose improvement program along Quincy Shore Drive at heavily-patronized Wollaston Beach Reservation.

Initial work at Wollaston, completed in 1974, was an \$875,000 culvert-type structure replacing the Sergt. Greenberg Bridge at Black's Creek, incorporating tidegates to control tidal action and maintain upstream water level. Finishing touches are in process on an \$827,000 contract for dredging Black's Creek to improve tidal flow and deepen the tidal basin for boating and a culvert under Southern Artery to alleviate flooding. Nearing completion is a \$968,000 project to reconstruct a 3000-foot section of Shore Drive in the same vicinity, including a median strip, sidewalk, bicycle path, pedestrian lights, rip-rap on the shoreline and recreation facilities at Caddy Park, known also as Treasure Island. Nearby historic Moswetuset Hummock has been given a \$42,686 facelift, with tree-planting, landscaping, a rustic bridge and a new channel for free-flowing tides around the Hummock. Another improvement in the planning stage is a multi-service center on the newly-acquired site of the former Kimberly's Restaurant and an adjoining parcel. The proposed structure will contain public restrooms and a police sub-station.

Development of a passive recreation concept has been

completed at Stodders Neck in Hingham, a 22-acre peninsula on Weymouth Back River acquired in 1972. A \$243,000 contract has installed walking paths, picnic areas, parking, landscaping, a boat landing and a promontory offering a spectacular view of Hingham Bay, Quincy Bay and Boston Harbor.

A neglected eyesore at Patten's Cove, off Morrissey Boulevard, Dorchester, is being converted into an attractive, five-acre natural park under a \$137,465 contract. The site in the Savin Hill section will be enhanced by tree and shrub planting, regrading, channel excavation and stabilizing the shoreline of the tidal basin.

In the Blue Hills Reservation, a \$263,000 contract has been awarded for a 165-seat auditorium-classroom at the popular Trilside Museum to accommodate natural history educational programs and an exhibit construction and storage area. The barn-like structure is an addition to the museum's original Dutch colonial farmhouse. Under design are improvements to parking lots and grounds, including a new garage, landscaping, animal furnishings and relocation of fences and cages in the animal exhibit area.

Design work is also proceeding on upgrading the heavily-used Houghton's Pond area of Blue Hills Reservation by restoring much of its former natural beauty. Important features of the project consist of improvements to worn and eroded areas, relocation and redesign of access roads and parking spaces, overhaul and blending of equipment with the natural area, new play equipment and informal plantings.

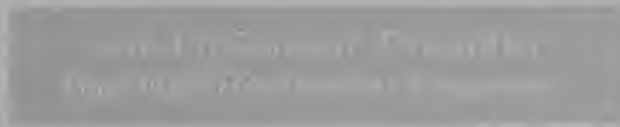
MDC's network of ice-skating rinks reached 26 with the completion of a \$1,768,275 facility at a projected waterfront park in Boston's North End in time for the 1975-76 season. Incorporating a new architectural concept, the rink provides wide-open harbor and park views from its large window-walls and has seating capacity for 500 spectators.

A \$1.7 million program has provided for fully-enclosing three open-sided rinks and major improvements such as new refrigeration systems, lighting and other features. This work has already been completed at the Bryan rink in West Roxbury, while a similar project at the Reilly Memorial rink at Cleveland Circle, Brighton, is scheduled for completion in the fall of 1976. A construction start will be underway shortly at Allied Veterans Memorial rink in Everett. The conversions will leave only nine open-sided facilities out of 26.

Extensive repairs have been completed at tennis, basketball, handball and fences under a \$123,040 project covering facilities in Boston, Somerville, Dedham and Nahant. At Everett, two new tennis courts were installed.

In the sixth year of an aesthetic and environmental program, 2107 trees were planted through the park system, bringing the total plantings to approximately 17,000 in parks and along roadways and waterways.

An uncertain future still faces Boston Arena, which became MDC property on July 1, 1975, when the Boston Arena Authority was dissolved. The planned purchase by the City of Boston for \$450,000 has not yet been consummated, but the city has been given care and control for use as a municipal sports center pending final disposition.



The spectacular 4th of July celebration at Hatch Shell on the Charles River Esplanade stole the nation's Bicentennial spotlight as the greatest holiday event in Boston's history and easily the highlight of MDC's 1976 summer recreation season.

In a spirit of patriotism and good will, 400,000 people jammed the Boston and Cambridge shorelines of the river, roadways and buildings for Boston Symphony's Esplanade Pops concert conducted by Arthur Fiedler and a massive fireworks display, while millions watched on a national television network and local TV stations.

The massive attendance — double the anticipated turnout — was a big challenge in logistics, traffic congestion and crowd control for the 160-man MDC police detail and five police boats, but the event was remarkably free of incidents. An aid also were Boston officers handling traffic on nearby city streets, 100 volunteers equipped with walkie-talkie units, first aid stations and ambulances — all coordinated by an operations and communications center on an 11-story building rooftop overlooking Hatch Shell and the Esplanade.

Patriotic selections dominated the musical program, but the growing renown of Arthur Fiedler's unique presentation of Tchaikovsky's 1812 Overture for the third season was the evening's climax. The performance was punctuated by firing of 105 mm howitzers accompanied by amplified bell ringers and nearby church bells coordinated with fireworks. The finale's mammoth aerial fireworks show fired from three barges thrilled spectators ashore and aboard hundreds of boats anchored in the river. Sponsor of the program was the non-profit Boston's Fourth of July, Inc. in cooperation with MDC. Its aftermath — homegoers tangled in heavy traffic well after midnight and a two-day cleanup of 40 tons of rubbish, including 50,000 donated plastic bags distributed to spectators for their trash.

The next night brought another heavily-attended event in the series of Bicentennial celebrations utilizing MDC facilities. A fireworks display at Carson Beach sponsored by the City of Boston drew a crowd of 60,000, again posing crowd control problems for police and leaving behind over 40 tons of trash along MDC beaches from Tenean Beach in Dorchester to South Boston's Castle Island.

Then came the international Tall Ships parade in Boston Harbor on the following Saturday, when an estimated 250,000 thronged MDC's Castle Island and adjoining Massport facilities. A 180-man police detail dealt with the large influx of visitors and traffic congestion on heavily-traveled roadways as spectators poured into vantage points along the harbor. Police involvement was required also for the next



WOLLASTON BEACH is among MDC's 17 ocean beaches which provide a big attraction for millions, while many turn to four fresh water beaches, 19 swimming pools and various wading pools scattered through the Parks District.

day's Sunday visit by Britain's Queen Elizabeth and her husband, Prince Philip.

Meanwhile, MDC's year-round recreational opportunities continued to expand in scope, particularly such activity as sailing, harbor island facilities and outdoor attractions along the 8 ½-mile Charles River Basin and its shoreline park reservation.

Charles River Magnet for Recreation

Millions of outdoor enthusiasts enjoyed passive and active recreation along the Charles, ranging from boating of every description to a series of parks, playgrounds, athletic fields, tennis, swimming and wading pools, a summer theater at Herter Park, skating rinks, a bikeway network and restful sunning and strolling.

Among the myriad activities for recreation and relaxation on the Charles, the Hatch Shell was a prime magnet, drawing 741,000 for 33 highly-varied performances. The repertoire ran the gamut from Boston's Symphony's 10 traditional Esplanade Pops concerts and four "Bach in the Basin" presentations by the Esplanade Mozart Orchestra to nine nights of "Ballet on the Esplanade" by the Boston Ballet company. A unique event was a two-hour "Polynesian Fantasy" production with 300 dancers viewed by 20,000 followed by a fireworks display from a river barge, attracting an estimated 60,000 on both riverbanks. The program was sponsored by Nichiren Shoshu Academy, a Buddhist laymen's organization devoted to achieving world peace, as "a special Bicentennial present to Boston." Large crowds were entertained also by 60 band concerts at various beaches and reservations during the summer season.



A popular sightseeing experience has been revived by a new excursion boat service in the Charles River Basin, following a lapse in recent years. The eight-mile round trip between Museum of Science and Lars Anderson Bridge aboard the 62-passenger "water-bus" restores a longtime traditional method of viewing scenic and cultural landmarks in Boston and Cambridge.

An innovative four-day experiment in rerouting Sunday traffic from a 1 ½-mile stretch of Memorial Drive was so successful in early spring that MDC extended the Sunday shutdown for the entire summer to provide more riverfront area for casual enjoyment by Cambridge residents. The trial period sought by People for Riverbend Park confirmed last year's one-day successful experience, inaugurated by a carnival atmosphere, complete with costumes, kite-flying, folk dancing and music.

The largest happening on the river basin was the Head-of-the-Charles Regatta, described as the biggest rowing event in the world. In its 11th year, the late-October competition over a three-mile course saw 683 racing shells powered by 2870 oarsmen and women participate in 18 events. Over 50,000 lined the shore and bridges to watch the regatta, sponsored by Cambridge Boat Club.

Sailing, Canoeing Activity Growing

Upriver, the resurgence of canoeing is growing steadily, particularly under the auspices of Lincoln Guide Service housed at the MDC Police Riverside sub-station in Auburndale. In four years, canoeists have increased from 4000 to 16,500 and the rental livery has grown to 60 canoes. Attracted by the appeal of physical fitness, healthy recreation and ecological and historical interest in the river, participants have included school, organization and employee groups. Water safety instruction and canoeing techniques have been stressed for neophyte canoeists and one-day and overnight trips were available. In its second year's operation under MDC ownership, the newly-acquired Needham YMCA's Red Wing Bay canoe livery was utilized by 2165 participants. The facility was incorporated into recreational summer programs spon-



***BICENTENNIAL CELEBRATION** at Hatch Shell on the Charles River Esplanade was packed at every vantage point on July 4th by 400,000 people attending Pops concert conducted by Arthur Fiedler and a massive fireworks display. This Boston Globe photo by Ted Dully was taken more than three hours before festivities began.*

sored by the town of Needham, day camps and youth centers. The site also served as a launch site for privately-owned canoes.

One of the most picturesque sights in the lower basin is MDC's sailing program, established in 1936 and operated by Community Boating, Inc. With a fleet of 93 sailboats, four launches and four rowboats, membership in the self-sustaining operation was increased to 6972 senior and junior participants. Enrollment of physical education classes totaled 470 students from 22 public and private schools and colleges. A wide range of activities was offered, such as sailing instruction, races for juniors and seniors, a rowboat regatta, Junior Olympics, harbor trips and social events for youths and adults.

A surge of interest in sailing has been met by development of two new programs during 1976 and three others in recent years. A community program was inaugurated on the Charles River basin in Cambridge this season as part of an agreement

allowing Massachusetts Institute of Technology to enlarge its boating pavilion. In Dorchester Bay, near Columbia Point Brighter Day, Inc., initiated sailing for inner-city youth, attended largely by minority groups.

The Pleasure Bay sailing facility at Castle Island, South Boston, serving the Parks District's southern area for its fifth season, enrolled 1730 members and also furnished a number of unique services. These included classes for the blind, handicapped, special children and the elderly. The facility was used, too, for athletic programs of Boston schools, the Massachusetts High School Sailing Championship and the New England Prep Schools Championship.

In its third year's operation, sailing in the Mystic River Basin has enrolled nearly 3000 participants at MDC's new boathouse and pavilion on the Somerville shoreline, designed to accommodate the district's northern region. A small-scale sailing activity at Constitution Beach, East Boston, initiated a



Jack Maley, MDC



CHARLES RIVER offers ideal canoeing for group excursions on the upper river and sailing for youngsters and adults in the basin against a backdrop of Beacon Hill and downtown Boston.

year ago, has grown to 125 participants equipped with six sailboats and a safety launch. Sponsor is the North Shore Recreational & Social Center, which operates an extensive summer program utilizing the skating rink located at the beach.

Heavy volume of other boating was recorded. At the Charles River Dam 15,247 boats passed through the locks, while 13,420 were logged at the Amelia Earhart Dam's locks on the Mystic River.

Harbor Islands Popular

In another marine environment, MDC's Georges, Lovell's and Peddocks islands have shared the continuing development of Boston Harbor Islands Park with the Department of Environmental Management (DEM), spearheaded by the Executive Office of Environmental Affairs.

Expansion of activities, services and access made significant progress, introducing many new visitors to the natural beauty, recreational resources and the tremendous potential of 30 harbor islands.

A free seasonal "water taxi" service linked Georges with nearby Lovell's and DEM islands, while two boat lines eased access by reducing round-trip fares to encourage week-day attendance on Mondays, Tuesdays and Wednesdays. Free boat transportation was made available to 5300 low-income community groups.

Public attention was focused on the urban aquatic park during Boston Harbor Islands Week in July. Among the special events were a yacht regatta honoring the arrival of the Tall Ships, tours of historical and natural sites, an authentic Civil War muster at Fort Warren, children's programs and the first

annual Governor's Cup sailboat race.

Enjoyment of Georges and Lovell's islands was considerably enhanced by improvements financed under a \$500,000 Federal grant. At Georges, a historical trail marked by interpretive signs was installed for Fort Warren and restoration work gave visitors more exposure to interior rooms and access to the upper ramparts for the first time. Other projects included tree planting, erosion control and protection against safety hazards. An interpretive nature trail, tree planting, fireplaces and camp sites were among the new installations at Lovell's. Specialized equipment acquired for management of the island park system included two police boats bought from the City of Boston and a rebuilt Navy landing craft used as a work boat to transport personnel and equipment.

The appeal of harbor islands was reflected in attendance at Georges Island estimated by police at upwards of 200,000, lured by its scenic appeal, picnic areas and historic Fort Warren. The fort is known particularly as a harbor defense in all American wars and a Civil War prison for Confederate civil and military personnel. Permits were issued to 490 groups, representing nearly one-fourth of the visitors. Lovell's Island drew 24,000 visitors, including 1288 campers and 4000 who used the beach under lifeguard supervision. Peddocks Island, off the Hull shore, was visited by nearly 2000. The island, acquired in 1970, is available only on a permit basis, mostly for camping and picnics, pending development of public facilities.

Fishing in MDC waters continues its popularity, especially at Quabbin Reservoir's three fishing areas where 64,321 were on hand in 1976 along shorelines and in boats. Available for rental were 53 outboard motors and 110 aluminum boats, while 13,065 private boats were launched by fishermen.



WINTER SPORTS facilities are easily accessible in the Parks District, including a well-equipped ski area in Blue Hills Reservation, cross-country skiing at Blue Hills and Martin Golf Course in Weston and 26 skating rinks.

Receipts reached a record high of \$96,498, yielding a net profit of \$2482. Elsewhere in the water supply system, 5264 fishing permits were issued for use at designated shorelines of Wachusett and Sudbury reservoirs. Fishermen also flocked year-round to fishing piers at the Lynn Harbor mouth of Saugus River and Castle Island, South Boston. An incentive to discover salt water fishing opportunities was offered to anglers by a Boston Harbor fishing tournament jointly sponsored by the State Executive Office of Environmental Affairs and MDC. Meanwhile, fresh-water sportsmen found improved fishing at a dozen ponds in park reservations, where stocking and weed control programs have upgraded fishing sites.

Golfing events focused considerable attention on MDC's 18-hole Leo J. Martin Golf Course in Weston and the two 18-hole layouts at Ponkapoag in the Blue Hills Reservation at Canton. A unique golf museum was completed on the grounds of the Martin course, displaying mementos of the late Francis Ouimet of international fame. The privately-funded building houses the Ouimet Caddie Scholarship Fund, Massachusetts Golf Association and Women's Golf Association. The course was also the scene of regional qualifying competition in the National Long-Driving contest for the benefit of junior golf.

At Ponkapoag, a five-day Junior Boys Golf School and Camp was held for the third year attended by 57 boys under sponsorship of New England Professional Golf Association. Other major events were the 33rd annual New England Junior



Golf Championship with 612 entries, the 37th CYO tournament drawing 529 contestants, the fifth Massachusetts Public Links Championship with 92 competitors and regional qualifying rounds in the National PGA Junior Tournament which attracted 60 boys and 10 girls — opened to female contestants for the first time. At Ponkapoag 86,000 rounds were played and 44,000 at Martin.

Most popular summer-time attraction is bathing at MDC's 17 miles of ocean beaches and four fresh-water beaches, attracting attendance estimated upwards of 15 million. Eighteen outdoor pools and one year-round swimming facility were used by nearly 400,000. Special programs were furnished such as swimming instruction for children, adults, handicapped youngsters and swim meets sponsored by high schools and local recreation departments.

For the winter season, principal activities are skating at MDC's network of 26 rinks, extensive downhill skiing facilities in the Blue Hills Reservation and cross-country skiing.

A substantial decline in the use of skating rinks since 1972 and heavy operational expense in the face of budget limitations have led to a two-year moratorium until 1978 on building additional skating facilities. The Commission also decided to use this period to evaluate usage trends and the possibility of future divestiture of rinks in the belief that they have become more local than regional in nature and might be appropriately operated by member communities. Attendance

MDC's New North End Rink Scores An Assist to Bruins

MDC's newest skating rink in Boston's North End scored an important assist to the Boston Bruins' hockey season.

The facility — hardly a stone's throw from the Boston Garden — was rented for morning practice sessions when the Garden was unavailable. Team spokesmen described the rink "as good as any they have seen."

The Bruins also looked to the MDC for emergency help during their historic game with the Soviet Red Army hockey team. With one of the Garden's two ice-conditioning machines out of commission, the other broke down between the first and second periods. The MDC rink's machine was dispatched with a police escort to the Garden and the game went on with minor delay.

has diminished to approximately 1.7 million from the two million peak for the 1971-72 season. Much of the reduction affected general skating, which was down about 261,000. The rinks furnished a variety of skating activity, including boys and girls hockey, classes for speed-skating, figure-skating, handicapped children and school physical education programs. Public skating was assigned approximately 48 hours weekly at each rink and rental use about 52 hours.

Off-season, 16 rinks were utilized for diversified summer fun, such as day camps, tennis, jogging, street hockey, basketball and social programs. Roller skating was inaugurated at the Dorchester rink by a neighborhood youth group. In an outstanding program at the East Boston rink adjacent to Constitution Beach, the North Shore Recreational and Social Center sponsored an evening street hockey league for 240 adults in addition to 845 young participants in varied day camp activity and community events. On the second floor of the beach bathhouse, a summer recreation program was initiated by Girl Scouts of several communities who shared rink use, sailing and other recreation with the North Shore group. Water safety instruction, workshops and field trips were among other Girl Scout activities.

The convenience of urban skiing in the Parks District continues as a boon to winter sports fans, although marginal snow conditions shortened the 1975-76 season. Cross-country skiing was available for the second year at the Martin Golf Course in Weston, operated by Lincoln Guide Service. The facilities offered rental equipment, instruction, lighted touring tracks and man-made snow when necessary. Attendance of 5000 included high school and employee groups and skiers from as far away as Cape Cod and Springfield. At Ponkapoag Golf Course in Blue Hills Reservation, Wilderness Trips furnished ski instruction and equipment rental. Floodlight night skiing is a big feature at Blue Hills Ski Area, where 25,000



WOODSY SETTING is a prime natural asset at Cutler Park in Needham and Dedham where unspoiled tranquility is found hardly nine miles from downtown Boston.

used the lifts and as many attended the ski school. The area is fully-equipped with artificial snow-making apparatus, a double chair lift, two J-bars and two rope lifts.

In the 5700-acre Blue Hills Reservation three active environmental and nature centers are offering stimulating education and wholesome recreation for classroom groups and outdoor enthusiasts. Chickatawbut Hill, a former Army Nike base converted into an environmental education center in 1975, has conducted 140 programs and courses attended by 2707 participants of all ages during 1976, nearly one-half consisting of school groups. Workshops for teachers and youth leaders were also provided. Trailside Museum was visited by 68,600, including 16,700 pupils from schools of the Parks District. Activity programs ranged from theme nature walks on week-ends to such special events as a Halloween night hike, a honeybee week-end and maple sugaring. Adult courses were conducted in ecology, birdlife and orphan animal care, as well as workshops for adult and junior naturalist volunteers. Both Trailside and Chickatawbut are managed for MDC by Massachusetts Audubon Society.

Another nature-oriented facility in the Blue Hills, Ponkapoag Outdoor Center, was operated by Greater Boston YMCA. Nearly 10,000 participants of all ages were enrolled in such activity as camping, educational sessions, family week-end and overnight stays, day camps, maple sugaring, horseback instruction and treks.

For the 23rd year, live theater was staged at 10 locations in the Parks District during the summer vacation by Boston Children's Theater sponsored by MDC.

Three MDC stadiums were heavily used for diversified activity. High schools scheduled 120 football games, two track meets and two graduations. Among other events were Gaelic football competitions, 42 rugby games and several drum and bugle corps contests. Athletic fields were booked for baseball, softball, Little League, soccer and field hockey. In response to growing interest in the sport, tennis courts were expanded to 42 which accommodated an estimated 50,000 persons.

New Franklin Park Zoo Developed by Funnings

Groundwork has been prepared for first-phase construction of the new Franklin Park Zoo, an innovative, year-round, 72-acre zoological garden featuring African wildlife in naturalistic settings.

The timetable is still uncertain pending adequate funding but planners are hopeful that work can begin next year on the tropical forest pavilion, to be followed by three other pavilions depicting a bush forest, desert and savanna.

Architectural plans and scale models of wildlife habitats have been completed, as well as extensive research on characteristics and behavior of 148 species of mammals, birds and reptiles that will inhabit the exhibits.

The 50-foot-high pavilions of steel and Teflon-coated Fibreglas will enclose 6½ acres of exhibits and viewing and service areas. Outside exhibits and visitor walkways will spread over a 20-acre adjoining area, featuring free-running, natural settings inhabited by homogeneous animal communities separated by hidden moats. Service and holding facilities will be housed along the perimeter of pavilions, allowing controlled access of animals to indoor or outdoor areas.

Phasing of the new zoo is expected to extend over the next eight years at an estimated cost ranging up to \$24 million, funded by Federal grants, MDC bond issues and private sources. The Boston Zoological Society (BZS), which manages MDC's Franklin Park Zoo, Children's Zoo and Stone Zoo

Zoo 'People' Events Climaxed By 10th BZS Birthday Party

Boston Zoological Society's ingenuity in staging unusual "people" events at Franklin Park Zoo rose to new heights on May 23 by staging the first dinner-dance ever held on the zoo grounds in celebration of its 10th birthday.

A huge red and white tent adjacent to "A Bird's World" accommodated 650 guests for the Saturday evening event, following a tour of the aviary, Traveling Zoo and scale models of the proposed African Zoo. The celebration continued on Sunday with family fun inside the tent. The birthday present was impressive, too, amounting to \$12,000 for the African exhibit fund.



NEW BIRD'S WORLD exhibit demonstrates the concept of natural settings and unobstructed display planned for new Franklin Park Zoo.

in Stoneham, has raised \$1.3 million of its \$6 million goal for natural exhibits, animals and educational graphics. MDC has available a \$5.3 million bond issue authorization, but estimates indicate additional funds may be needed for first phase construction. A \$3.9 million Federal grant is regarded as a strong possibility.

Meanwhile, BZS has been steadily broadening its scope of recreation, education, conservation and research activity and planning further expansion of these functions for the projected African zoo.

At the Children's Zoo, recreational opportunities have widened by providing periods of free admission each day—a policy that will be extended to other zoos when admission fees become effective. A fun experience for youngsters has been bottle feeding and other close contact with small animals. Extensive plans to revitalize the Children's Zoo are now being developed. Zoo facilities have been the scene of events ranging from live band concerts and animal-naming contests to birthday parties for children and BZS's gala 10th anniversary celebration.

Emphasis on wildlife education has brought 1700 elementary schoolchildren to formal multi-visit classes at Franklin Park Zoo during the year, introducing youngsters to the world of animals and birds and bringing together diverse groups from city and suburban schools. Most classes were held at the new "Bird's World," where the walk-through outdoor flight cage, open-fronted displays of live birds, mini-exhibits and classroom space provide a broad educational experience. The



Boston Globe

BREEDING ENDANGERED SPECIES has been emphasized at MDC zoos, highlighted by Betty Orang-utan's success in producing a three-pound son with the assistance of her mate, Stanley. Only 70 orangs have been born in captivity in the last 10 years.

teaching program is being expanded to Stone Zoo and into the community around Franklin Park through after-school school classes for children from local community agencies.

A new educational resource was installed at Children's Zoo in the form of a Theatredome, a dome-shaped structure offering free wildlife films, literature on endangered wildlife and animal fact sheets. Additional new exhibits included a native reptile and amphibian habitat and island exhibits of baboons, spider monkeys and gibbons. In other educational activity, live animals aboard the Zoomobile trekked into classrooms and other locations for 187 appearances and the Traveling Zoo scheduled 170 visits to outdoor facilities in the Parks District during the summer vacation. The educational value of exhibits at Stone Zoo has been enhanced by installing new natural habitats in the lower Aviary and remodeling the sea lion pool. The latter changes were also designed to encourage breeding activity by providing a proper environment for the females to whelp.

Conservation efforts have emphasized animal collections in breeding groups and acquisition of endangered species to protect them from extinction. As an example of the breeding policy's success, all species of primates are now rearing



HERCULES, 40-year-old tortoise, and friends get acquainted at Franklin Park's Children Zoo. The visit by youngsters and teacher was in conjunction with Easter Seal Society's communication development program for physically handicapped children.

young. Eighty-five mammals were born at the zoos in the past year, among them an orang-utan, antelope, two African lions, a camel and two Siberian tigers. There are now 1269 specimens in the entire zoo collection.

Significant research in animal husbandry and medical care has been undertaken at Franklin Park Zoo's animal hospital. This was one of 10 zoos nationwide selected to do clinical research on a tranquilizer anaesthetic compound. Along with 14 other zoos, the hospital has participated in a program utilizing contraceptives techniques in large cats. The results will be published for international distribution by the American Association of Zoo Veterinarians. In addition, the donation of equipment enabled the zoo to become one of only two in the country with the capability to study the normal blood-gas components of exotic animals.

The hospital staff, assisted by volunteer medical specialists, has a continuing educational program for animal care. In its preventive medicine techniques, the entire zoo collection is examined quarterly for parasites and medicated as necessary. Approximately 150 animals were hospitalized during the year by illness or injury, with an average confinement of 10 days. Another 300 were examined or treated in the field.

Boston Bicentennial Year Civil War Battlefield and Monuments

MDC's historic sites were among attractions for the influx of visitors here for the Bicentennial celebration, especially Bunker Hill Battlefield and Monument and Fort Warren on Georges Island.

Bunker Hill, which had its 200th anniversary observance in 1975, had an attendance of 30,910 visitors during the 1976 summer tourist season and 80,878 for the fiscal year ending June 30. The monument and grounds are slated for transfer in a few months to the National Park Service as part of the new Boston National Historical Park.

At Georges Island in Boston Harbor, police estimated upwards of 200,000 persons enjoyed its scenic and recreation facilities and viewed Fort Warren, a Civil War fortification and a prison for Confederate civil and military personnel. During the Spanish-American War and World Wars I and II, it served as a mine center for protecting Boston Harbor.

For the first full season an informative tour was available using electronic wireless headsets for a narrative description of the fort's features and history since its completion in 1850. This is similar to a system installed at Bunker Hill three years ago. An extensive improvement program, aided by Federal funds, included opening of 12 rooms in the fort, exhibits in the guardhouse and a walkway along one of the ramparts offering magnificent views of the island and harbor. Fifteen historic interpretive signs were erected and 500 trees and landscaping were installed on the island grounds.

Another Bicentennial attraction was the Quincy Homestead in Quincy, where electrical and other interior work was completed, supplementing previous structural, exterior and landscaping projects. The structure was the childhood home of Dorothy Quincy who married John Hancock in 1775. Constructed in the 1680's and enlarged in the early 18th century, the Homestead with its handsome furnishings of two centuries is administered by the National Society of Colonial Dames.

A significant restoration has been completed at Moswetu-set Hummock, off Quincy Shore Drive, home ground of the Indian tribe from which Massachusetts is believed to have derived its name. In preserving its original character, the work was limited to trail restoration, planting of trees and shrubs, a wooden bridge, a new channel to permit tides to flow freely around the Hummock and parking for 10 cars.

The Bicentennial year also saw a construction start on restoring Fort Independence at Castle Island, South Boston, a site rich in history dating back to 1634. Regarded as one of the oldest, continuously fortified site in the country, the installation was originally built of logs, earthworks of mud and masonry made of lime from oyster shells. It was rebuilt or substantially improved eight times, once by Lieut. Col. Paul Revere two years after its destruction in 1776 by the British



HISTORIC FORT INDEPENDENCE at Castle Island, South Boston, is in the midst of a major restoration project, preparatory to opening the fort to the public.

during their evacuation of Boston. The present granite structure was completed in 1851. The facilities, linked to the mainland by a causeway since 1891, have been used also as a hospital and prison.

Since acquiring Castle Island from the Federal government in 1962, MDC has developed low-keyed recreation activities and has now embarked on a \$857,000 first-phase restoration program in preparation for reopening the fort to the public as part of the Boston Harbor Islands State Park. The initial phase calls for concrete waterproofing and restoring earthen ramparts, installing a walkway overlooking Boston Harbor, preparing gun casemate rooms for exhibits and constructing utility lines.

A dramatic reenactment of the British evacuation of Boston in 1776 was staged at Castle Island, marking the event's 200th anniversary, complete with cannonfire, fireworks simulating bursting shells and small boats carrying British troops. A colorful pageant and parade to Dorchester Heights, site of Colonial fortifications, climaxed the observance.

Fort Independence has also been the scene of archeological digs for historic artifacts. Similar activity is underway at MDC's Peddocks Island and the interior and exterior grounds of Fort Warren on Georges Island.

Through the generosity of donors, MDC acquired and placed on display five dioramas portraying battles that precipitated the Revolutionary War. Three dioramas exhibited at the Saltonstall State Office Building showed in minute detail the Battle of Lexington Green, the Battle at Concord Bridge and the British Retreat from Lexington-Concord. The others, showing British and Colonial troops arrayed in the Battle of Bunker Hill, were permanently exhibited at Bunker Hill Monument.

Theme Six: Maintenance Bridge Program Planning

Extensive improvements and maintenance work on MDC's 168-mile network of parkways and roadways were accomplished during 1976, designed for greater motorist and pedestrian safety and smoother traffic flow.

Preparations moved ahead also toward much-needed replacement or reconstruction of several heavily-traveled bridges, weakened by age or by a shift from an original designation for pleasure vehicles to general traffic and heavy trucks in excess of design capacity.

The roadway program covered a wide range, including resurfacing, reconstruction, guard rails, highway lighting, traffic signals, a pedestrian overpass and electronic-eye warning signs to prevent trucks from being stuck beneath parkway underpasses or bridges, causing massive traffic jams. The warning system is expected to forestall an annual average of 100 such accidents caused mostly by out-of-state drivers unfamiliar with restrictions or careless in observing posted signs.

Following a successful experiment at one location, a \$57,745 contract has been awarded to install 10 more flashing neon devices on Memorial Drive, Storrow Drive and Soldiers Field Road. The equipment utilizes a laser beam at a 12-foot level which activates flashing lights on a sign bearing the message, "Truck Warning — Bridge Too Low — Take Exit." The sign locations allow drivers to take an exit before reaching a low-elevation structure.

An inventory and field inspection of MDC's 87 bridges has been completed as required for future Federal funds, with a finding that many were in need of repair work and some required reconstruction or replacement. About one-half of the structures are eligible for Federal grants.

Design work has already begun on a multi-million-dollar reconstruction of General Lawrence Bridge spanning Mystic River at Veterans Memorial Parkway, Medford, near Route 93 expressway. Major structural and electrical repairs are scheduled in 1977 for Dorchester Bay Bridge on Morrissey Boulevard at an estimated cost of \$300,000. Both projects will be performed under MDC contracts.

Through a cooperative effort with the State Department of Public Works (DPW), substantial Federal funds will be tapped for vitally-needed bridge replacement and other projects. As part of this program the DPW has begun design work on rebuilding the superstructure of Wellington Bridge carrying Route 28-Fellsbury traffic over Mystic River at the Somerville-Medford line, where emergency repair projects have kept the bridge in service in recent years. Similarly, DPW will undertake the design phase soon on Harvard Bridge over the Charles River, preparatory to replacement of the superstructure. Other DPW-MDC projects under construction are Bussey Street



Officer Willard Hardigan, MDC

FAMED MEMORIAL DRIVE, lined by an arbor of sycamore trees, preserves scenic parkway features on the Charles River shoreline.

Bridge over Mother Brook in Dedham costing \$190,000 and the River Street Bridge in the Hyde Park section of Boston, \$234,500, both with Federal aid.

Twenty-eight contracts for roadway and safety improvements were in effect during fiscal 1976 amounting to \$3.7 million, including three awarded in 1975 and completed this year and another still in progress. The latter, due for completion in a few months, is a \$967,644 project on a 3000-foot section of Quincy Shore Drive for reconstruction work, a median strip, sidewalk, bicycle path, pedestrian lights and other improvements. Reconstruction of a 1.6-mile stretch of Mystic Valley Parkway in Arlington was completed at a cost of \$282,684 and also a resurfacing job on a 1 1/2-mile section of Memorial Drive, Cambridge, for \$391,041. A number of smaller roadway and sidewalk jobs were also finished.

As an important safety measure, a \$357,235 pedestrian overpass was completed over Morrissey Boulevard at Pope's Hill Street, Dorchester, accommodating pupils attending an adjacent school and others visiting nearby Tenean Beach.

Attention was devoted to better lighting for motorists and pedestrians. A major street-lighting project was begun on Veterans of Foreign Wars Parkway, West Roxbury, replacing an outmoded 40-year-old system along a three-mile section, where 367 laminated wooden standards will be installed to blend with the parkway environment. Improved pedestrian-walk lighting has been completed along the Riverway, between Huntington and Brookline avenues, Boston, at a cost of \$42,670. Within a few months a construction start is scheduled on a \$259,509 lighting system on the Charles River Embankment walkways between B.U. Bridge and Leverett Circle, Boston.

An intensive study on updating and providing new traffic lights on MDC roadways is in progress to improve highway safety, with a final report due next year. In another facet of efforts to safeguard the public, more than three miles of guard rails have been placed in various locations at a cost of \$213,000.

Police, Police, Tow Trucks Aid Expressway Traffic

A new technique for alleviating tieups on a 7 1/2-mile stretch of Central Artery and Southeast Expressway has been launched by Metropolitan District Police, highlighting efforts to improve flow of peak hour traffic in the Greater Boston area.

Aimed at rapid removal of disabled vehicles, the system combines aerial observation for prompt spotting of breakdowns and accidents, heavy-duty police cruisers equipped with push-bars, motorcycle officers and two radio-equipped tow trucks operated by MDC's Central Services Division. For truck breakdowns, heavy tow equipment is also available.

In its first four months operation, police officials credit the operation for a significant reduction of major tieups caused by disabled vehicles, which create massive congestion and traffic back-up into other roadways. During this period, there were 1687 responses by emergency units for towing and pushing vehicles stranded by flat tires, empty gas tanks and mechanical troubles or disabled by accidents. The expressway units are available between 6:30 and 9:30 A.M. and 3:30 and 6:30 P.M. MDC has police jurisdiction over the area, while the State Department of Public Works is responsible for maintenance.

Among the participants in the expressway assignment are the Traffic Oriented Patrol Squad (TOPS) and an officer observing traffic from the air, both new functions inaugurated last year. The 62-man TOPS unit deals with high priority traffic problems and serves as a mobile force for various emergencies. The flying officer flashes reports to headquarters on traffic problems anywhere in the MDC system and transmits information on travel conditions to motorists via a Boston radio station which supplies the aircraft and pilot.

The police force coped with heavy demands during the year imposed by its participation in Boston's Phase 2 school desegregation program, huge crowds at major Bicentennial events, emergency assistance to other police jurisdictions and an intensive crackdown on drinking problems at beaches. At times, the entire manpower was on duty, with days off canceled on all shifts. The undermanned force has been reduced 162 men below its authorized strength of 665 by hiring restrictions.

Nearly 300 men were supplied at the beginning of Boston's 1975-76 school year. The number was gradually reduced during the first few months and ultimately fell off entirely, except for occasional assistance. Overtime costs and other special expense were compensated by a \$675,000 allocation from state funds.

Crowd control at Bicentennial summertime celebrations posed a big challenge, particularly a turnout of 400,000 on July 4th for the spectacular Esplanade concert conducted by Arthur Fiedler at Hatch Shell and a dramatic fireworks display



Bob LaPree

UNDERWATER RECOVERY UNIT has won national recognition for its expertise. On the Merrimack River at Manchester, N.H., MDC Police scuba divers are shown on July 1 as they recovered a murder weapon linked to the slaying of a Tewksbury doctor, his wife and son. The gun proved to be vital evidence in the investigation and prosecution of the murder case.

on the Charles River. The 160-man police detail was credited for an outstanding performance in managing massive traffic congestion and attendance, described as the largest for any event in Boston history.

On the following week-end, full police manpower was mobilized to handle crowd and traffic control for Saturday's international parade of sailing ships in Boston Harbor, known as "Operation Sail," and the Sunday visit by Britain's Queen Elizabeth. MDC officers also joined in stringent security required for the Queen and her husband, Prince Philip. The huge influx of spectators had considerable impact on MDC facilities and roadways under its jurisdiction.

Frequent police involvement in visits by President Ford and other dignitaries led to participation by an MDC captain in a Dignitary Protection Seminar in Washington, sponsored by the FBI and U.S. Secret Service.

MDC Police responded to numerous emergency calls from other agencies, such as disorders at the State House, Middlesex House of Correction, Charles Street Jail, various cities and towns, as well as Boston racial outbreaks and a rear-end train collision near MBTA's Charles Street station which injured scores of passengers.

An important role was played by police when an ice jam caused a freak flood at Moody Street Dam on the Charles



SPECIAL UNITS of Metropolitan Police are patrol boats assigned to extensive MDC waterways and mounted police for surveillance of park reservations and crowd control.

River in Waltham. Officers manned amphibious vehicles to assist in breaking up the ice and provided helicopter observation, while other units warned people in the threatened area.

Disturbances and extensive littering by liquor and beer cans and bottles brought on hundreds of arrests for violating rules against alcoholic beverages at beaches, mostly at Nahant. One indignant judge imposed an unusual sentence requiring cleanup work at Nahant Beach, while another gave defendants a choice between a fine and picking up litter at the same beach. Most offenders chose the cleanup task. Numerous arrests were made also at Winthrop and Nantasket beaches.

Stringent provisions of a new law requiring highly-advanced training of officers manning ambulances have resulted in phasing out ambulance service and relying on certified private or municipal resources as a more practical alternative. MDC vehicles are being used only in cases of minor injuries or illness or when no other ambulance is available or in the event of a major catastrophe in which sufficient certified ambulances are unavailable.

The MDC Police Academy has conducted its first citizen-oriented course in cardio-pulmonary techniques for use prior to arrival of professional personnel. The program's emphasis will be shifted in the coming year to training of police officers.

During the fiscal year ending June 30, 1976, Metropolitan District Police investigated over 5800 crimes, 2807 of which were relatively serious. Close to 50% of the crimes were closed by an arrest.

In the same period, police handled 4427 motor vehicle accidents. In their efforts to prevent accidents police issued over 27,000 motor vehicle citations. Police recovered 1420 stolen vehicles of which 1397 were taken from MDC roadways. Stolen property recovered was valued at nearly \$2 million. On 216 occasions blood or vital medical supplies were carried from and to area hospitals.



Officer's Ocean Swim Nets Capture of Suspect

A unique arrest has been written into the annals of police history involving an elusive, fleeing teen-ager wanted on breaking and entering charges and a determined MDC officer.

The pursuit had reached Revere Beach, where the youth leaped from the seawall and waded into the ocean, concealed by darkness and heavy rain. Undeterred, the officer stripped to the waist and plunged into the water. Five minutes later, he swam ashore, towing the suspect behind him.

A major activity of the Metropolitan Police is assistance to cities and towns. On over 3100 occasions assistance was provided to other police departments and 15,500 assists to the general public.

Demands on police patrol boats continue to grow, reflecting constantly increasing use of MDC's harbor islands and Charles and Mystic rivers. Visitors voyaging to Georges, Lovell's and Peddocks islands during the 1976 season exceeded 300,000, according to police estimates, requiring stepped-up police activity on the islands and in harbor waters. Six officers manning two patrol boats made 4817 trips to the islands, mainly Georges, representing a 16% increase over 1975. A great variety of services was performed, including 21 persons rescued, 106 search and rescue missions, 102 persons assisted, 36 transported to hospitals, first aid rendered to 1020 persons, 93 boats towed and 410 boat inspections. These combined statistics rose 34% above the previous season.

How MDC Organization Delivers Regional Services

The Metropolitan District Commission's concept is based on the belief that communities in Metropolitan Boston can derive greater benefits with more efficiency and lower costs through regional operation of parks, water and sewerage systems.

It has become increasingly evident that many facets of urban life and the environment can be developed and administered most effectively without regard for municipal boundaries.

This trend originated in 1889 with the creation of the Metropolitan Sewerage Commission as the nation's first legally-constituted metropolitan district. Then came the Metropolitan Parks District in 1893 and the Metropolitan Water Board in 1895. The three agencies were consolidated into the Metropolitan District Commission in 1919 for greater efficiency and economy.

MDC operations are governed by a five-member Commission. A Commissioner named by the Secretary of Environmental Affairs, subject to the Governor's approval, serves as full-time executive and administrative head of the agency. Four part-time Associate Commissioners appointed by the Governor join the Commissioner at weekly meetings in setting policy, approving contracts and participating in decisions on departmental operations. The Commissioner and Associate Commissioners each have an equal vote, except that "concurrence of the Commissioner and of not less than two Associate Commissioners shall be required for the execution of contracts and of such other official actions of the Commission as may be required by law."

The Reorganization Act of 1969 establishing a cabinet system placed MDC under the jurisdiction of the Executive Office of Environmental Affairs.

As a department of the Commonwealth of Massachusetts, MDC is under the jurisdiction of the Governor and Legislature, including approval of its operations budget and bond issues for capital construction.

To keep cities and towns informed about activities, public hearings are required annually for municipal officials in the Parks, Sewerage and Water Districts regarding improvements, extensions, new facilities and financial data.

The organizational structure includes five administrative or staff units: Commission Secretary, General Counsel, Commissioner's Office, Special Projects and Central Services.

Major support services are assigned to the Central Services Division. These include purchase and maintenance of motorized equipment, bulk purchase of supplies, sign produc-

tion, maintenance of MDC headquarters building, police stations and Commission-owned homes and acquiring special equipment for emergency operations. Central Services crews operate two tow trucks for prompt removal of disabled vehicles from the Central and Southeast expressways to minimize traffic backup during peak hours. An additional tow truck and two road service vans are available for further emergency use. An extra-heavy-duty tow truck is on standby for handling large trucks and removing vehicles from waterways.

Departmental operations are performed by seven divisions: Engineering, Sewerage, Water, Parks, Police, Environmental Planning and Environmental Quality. These divisions report to the department's Chief Engineer.

An in-house Project Analysis Board reviews proposed projects and submits recommendations to the Commission. A Land Board, another in-house unit, establishes priorities for land acquisition and recommends action on land use, sales, parks development and related matters.

All legal aspects of the agency's functions are supervised by the Office of General Counsel, such as drafting legal opinions, contracts, proposed legislation, directives and rules and regulations, dealing with public bidding procedure, conducting or participating in quasi-judicial hearings in the areas of personnel, labor relations and police administration, and advising the Commission on various questions of law.

The legal process of land takings, easements and conveyances is performed by the Right of Way Section for recreational, flood control, sewerage and water supply purposes. Permits, easements, deeds and other types of instruments are also processed, along with maintaining and updating a land inventory. The section has an enforcement unit which deals with encroachment on MDC lands, pollution of rivers and streams and other similar violations.

A Planning Section is primarily concerned with park and recreational development, roadway system improvements, landscaping and open space acquisition.

The Financial Office operates a data-processing unit for payroll and other departmental uses, processes all receipts and disbursements, maintains fiscal records and serves as the department's accounting office. Interviews and job placement functions are handled by a Personnel Office, which also negotiates collective bargaining agreements, maintains personnel records, co-ordinates enrollment in training courses and conducts an alcoholic rehabilitation program.

A reference library serves as a source of historical data, publications, reports and other information.

OPERATING DIVISIONS

ENGINEERING

The Engineering Division is responsible for planning, engineering and supervising construction of facilities for the Water and Sewerage divisions, flood control and drainage and major Parks District projects. The division's chief construction engineer also has administrative management and engineering oversight of the Parks Engineering Section, which was formerly a separate division. Completed facilities are turned over to operating divisions for maintenance and operation.

Nineteen contracts amounting to \$16.6 million were awarded during fiscal 1976. Work was still in progress or contracts were completed totaling \$6.4 million for eight projects begun in prior years. Additionally, work was in progress on the new Charles River Dam under a \$35 million contract in cooperation with the Army Corps of Engineers which is supervising the project.

Parks Engineering Section personnel are engaged in Parks District projects involving designing, engineering services, contract document preparation and supervision of new construction, as well as major repairs of park and recreation facilities, roadways, bridges, drawbridges and locks, street lighting and traffic controls. Upon completion, new facilities come under the jurisdiction of the Parks Division for operation and routine maintenance. Thirty-eight contracts were awarded for Parks District work during the fiscal year totaling \$5.6 million. There were 16 additional contracts previously awarded and still active or completed in fiscal 1976, amounting to \$4.4 million.

Other Engineering Division activities consist of land surveys, hydraulic investigations of water and sewer lines; river hydraulics, materials testing, water and sewage analysis, photographic work and aerial photography, architectural services, landscaping, park and recreational developments; legal assistance, preparation of contracts, review and selection of consultant submittals, and participation on committees for land acquisition, solid waste, water resources, environmental impacts, water quality and project analyses.

WATER

The purpose of the Water Division is to furnish pure water to local distribution systems of communities in the Metropolitan Water District and such other cities and towns as can be reasonably supplied.

Twenty-five communities receive their entire water supply and seven a partial supply, with an area of 309 square miles

and 1,836,240 population. The City of Woburn (pop. 35,330) was admitted as the 33rd member in 1972 as a partial user, but will not be linked to the system until completion of a new pipeline and pumping facilities. The Town of Wellesley (pop. 26,590), which became the 34th member in 1974, has a "readiness to serve" agreement and plans to rely on its own supply for the present. Ten communities in Central Massachusetts located near MDC reservoirs and aqueducts are supplied in whole or in part under special agreements.

The Water District's sources are the Quabbin, Wachusett and Sudbury watersheds and the runoff of the Ware River watershed during certain periods. Storage reservoirs on these watersheds have a capacity of 495 billion gallons, principally at Quabbin Reservoir with its capacity of 412 billion gallons and Wachusett's 67 billion gallons.

The water supply is delivered to Metropolitan Boston through 131 miles of aqueducts and tunnels and distributed via approximately 260 miles of pipelines, mostly by gravity flow.

Facilities under control of the Water Division include six storage reservoirs with 467 square miles of tributary watershed, a water surface of 30,000 acres, four hydro-electric power stations, 16 miles of high tension power transmission lines, 12 distribution pumping stations to service high elevations and 16 distribution reservoirs with a capacity of 3.1 billion gallons.

Eight contracts for construction work, maintenance or repairs were awarded during fiscal 1976 for a total of \$461,534. Work was completed on eight contracts awarded in 1975 totaling \$199,013.

SEWERAGE

An intricate sewerage and treatment system is under the jurisdiction of the Sewerage Division. Its vast sewage collection and pollution abatement functions require maintenance and operation of 12 pumping stations, two treatment plants, four pre-treatment headworks, a detention and chlorination station for combined stormwater and sewage overflows along Charles River Basin, a pre-treatment and chlorination station for combined overflows at Mystic River Basin and 226 miles of trunk sewers.

Forty-three cities and towns covering 406 square miles, with 2,180,074 inhabitants and a contributing population of 1,980,083, are members of the Sewerage District. Wastewater flows through 5146 miles of local sewers connected to MDC trunk lines at 1812 locations, an increase of 58 miles over the previous year. The municipal lines link 400,694 individual connections with the MDC system, an increase of 2953

in the past year. Per capita cost of sewerage operations in 1976 was \$8.17 of which \$5 was for maintenance and operations and \$3.17 for debt service.

Average daily sewage load was 468 million gallons and the 24-hour maximum flow was 706 mgd passing through primary treatment and chlorination at Deer Island and Nut Island plants before a discharge via outfalls into outer Boston Harbor. The process provides screening and grit removal, pre-chlorination, pre-aeration, primary sedimentation and post chlorination. Raw sludge is treated by thickening and high rate digestion prior to discharge, producing a by-product of methane gas utilized for electrical power and heating.

There were 15 contracts awarded by the division or in force during fiscal 1976 totaling \$632,544, including \$317,125 for inflow/infiltration studies related to three sewer relief line projects.

PARKS-RECREATION

The Parks and Recreation Division is responsible for maintenance of extensive Parks District property and supervising recreation programs for the benefit of 37 cities and towns and a population of 1,984,940 within the district.

Under its jurisdiction are nearly 15,000 acres of parkland, including five major reservations and 17 miles of beaches, 26 skating rinks, 19 swimming pools, three 18-hole golf courses, three harbor islands, the Charles, Mystic and Neponset rivers within the District, 168 miles of roadway and a wide variety of other recreation facilities and parks.

Its Recreation Services Section develops, schedules and oversees recreational use of facilities, such as rinks, pools, Hatch Shell, stadiums, athletic fields, golf courses, special events and miscellaneous recreational activity.

The division also operates locks and drawbridges and has administrative and maintenance responsibility for the Franklin Park and Stone zoological parks.

POLICE

Primary mission of the Police Division is protection of MDC property and people using its facilities and patrol of 168 miles of MDC roadways and 18 miles of the Northeast, Southeast and Central Artery expressways within Suffolk County, which are maintained by the State Department of Public Works. The division also has full police powers in any community where MDC has property.

Its broad responsibility for law enforcement at parklands, waterways, harbor islands and roadways requires highly diversified functions and equipment. Daily use of a K-9 unit, detec-

tives, narcotics officers, mounted police and boat officers enables the force to patrol a widespread and diversified environment. Patrol officers with specialized capabilities, such as scuba diving and bomb disposal, are often called from their regular duties to perform these hazardous functions. Special equipment, such as breathalyzers, radar, underwater communications and police boats are used regularly by MDC officers.

A Traffic Oriented Patrol Squad (TOPS) deals primarily with enforcement at high accident locations and top priority traffic problems. TOPS functions also as an effective mobile force for quick response to serious emergencies anywhere in Metropolitan Boston. Aerial surveillance of the traffic scene is in effect during weekday peak hours, utilizing a plane furnished by a local radio station. The flying policeman provides radio broadcasts on traffic conditions to the public and informs police headquarters about disabled vehicles, accidents and tieups as a method of expediting response and easing traffic congestion.

ENVIRONMENTAL PLANNING

Responsibility for a wide range of environmental concerns has been assigned to the Environmental Planning Division. The agency administers the Federal and State Environmental Policy Acts for MDC, such as preparation of environmental impact reports and assessments and review of similar reports by other agencies affecting MDC facilities. It also has prime responsibility for water and wastewater planning and program implementation. Other services include representing MDC on Federal, State and regional committees, land use planning, assistance on regulatory permit procedures and consultant contract administration and management.

The division coordinated and managed the newly-completed wastewater study for the Eastern Massachusetts Metropolitan Area in conjunction with Army Corps of Engineers. Study recommendations for pollution control facilities totaling \$855 million are now being implemented.

ENVIRONMENTAL QUALITY

Specialized services dealing with environmental problems affecting the air, land and water are furnished by the Environmental Quality Division. Its primary functions are developing and managing projects designed to protect and improve the environmental quality of the areas under MDC jurisdiction, monitoring water quality of the metropolitan rivers and their tributaries and MDC beaches and pools and advising MDC on matters affecting the environment.

Assessments Primary Source of MDC Financing

As a regional public agency, the Metropolitan District Commission is financed primarily by assessments on 54 communities which are members of one or more of its three districts.

Additional funds come from the State Highway Fund, state allocations for certain flood control projects and miscellaneous revenue such as fees, rentals, licenses, permits, fines, penalties, sales and Federal reimbursements or grants.

The operating budget and bond issues for capital construction are subject to approval by the Governor and Legislature.

Principal financing sources for the three districts are the following:

PARKS — Recreational capital construction by bond issues, amortized by assessments based on property tax valuations of communities in the district; maintenance of boulevards and reservations and police costs by 67% from the State Highway Fund and 33% by member cities and towns, with one-third based on population and two-thirds on valuation; highway and bridge construction by legislative allocations from state highway bond issues.

WATER — Charge of \$240 per million gallons, with special provisions for communities outside the Water District.

SEWERAGE — Debt requirements are assessed on the basis of total population and a "population equivalent" formula for contributing industries, commercial establishments and other uses, effective for 1976. This replaces previous assessments based on capacity of municipal sewers connected to the MDC sewerage system. Maintenance and operation expenses are apportioned in relation to total population. For 1977, this will be shifted to residential population actually served by the system and a "population equivalent" charge for industries, etc.

For the fiscal year ending June 30, 1976, the Commission spent \$47,496,147 on maintenance and operations, a decrease of \$386,523 below 1975. Interest and principal payments on bonds issued for capital projects and water fund deficits amounted to \$26,812,727, up \$2,136,436 over 1975. The combined expenditure was \$74,308,874, a rise of \$1,749,913 over the previous year.

An additional \$3,014,692 was expended for highway construction from state highway bond funds and for certain flood control projects from special authorizations, which do not reflect in assessments on MDC cities and towns.

The \$77,323,566 total represented 61% for maintenance and operations, 35% for MDC bonded debt and 4% for expenditures from state bond funds.

EXPENDITURES

	1976		1975	
	Operations	Debt	Operations	Debt
Administration	\$ 810,777		\$ 834,376	
* Parks	26,567,600	\$ 7,275,634	26,501,221	\$ 5,650,234
Sewerage	10,613,821	7,612,727	10,432,385	7,639,461
Water	<u>9,503,949</u>	<u>11,924,366</u>	<u>10,114,688</u>	<u>11,386,596</u>
	\$47,496,147	\$26,812,727	\$47,882,670	\$24,676,291
Total	\$74,308,874		\$72,558,961	

* Includes cost of MDC Police operations.

Note — An additional \$3,014,692 was spent in 1976 and \$4,251,973 in 1975 for highway construction projects financed by state highway bond issues and flood control and other special authorizations financed by state General Fund bond issues rather than assessments on MDC cities and towns.

PRINCIPAL INCOME SOURCES

	1976	1975	
Parks	\$16,767,827	\$15,544,558	37 Cities & Towns
Sewerage	18,881,306	16,448,453	43 Cities & Towns
Water	24,144,492	20,293,639	32 Cities & Towns
State Highway Fund	17,600,292	15,900,733	
State General Fund	—	347,071	
Revenue	3,280,254	3,402,621	Admissions, Sales, Fees, etc.
Water Deficit	—	*7,785,000	
Bonds			
Total	\$80,674,171	\$79,722,075	

Note: Income figures for Parks, Sewerage and Water differ slightly from assessment table, due to various adjustments. Sale of power, licenses, fees, concession permits, etc., do not accrue to the Commission for re-use, but rather flow directly into the appropriate fund and thereby reduces assessments against cities and towns. Federal reimbursements ordinarily have the same effect.

* Represents water fund deficit in 1974. This is anticipated to be the last bond authorization to cover such deficits

OUTSTANDING DEBT, JUNE 30

(In millions of dollars)

	Sewage	*Water	Parks	Total
1976	\$ 85.671	\$ 130.998	\$ 50.843	\$ 267.512
1975	89.993	137.739	55.650	283.382
1974	87.047	132.646	41.481	261.174
1973	91.301	130.268	39.997	261.566
1972	95.555	129.285	40.353	265.193
1971	93.659	117.663	37.128	248.450

*Includes Water Fund deficit debt.

TOTAL PERMANENT AND TEMPORARY EMPLOYEES AS OF JUNE 30

	1976			1975			1974		
	Perm.	Temp.	Total	Perm.	Temp.	Total	Perm.	Temp.	Total
Administration	54	1	55	54	1	55	57	4	61
Engineering	238	-	238	258	-	258	259	-	259
Highway Engineering	-	37	37	-	39	39	-	43	43
Parks & Parks Eng.	600	1157	1757	684	1120	1804	658	1094	1752
Police	475	29	504	516	26	542	579	23	602
Sewerage	430	-	430	437	1	438	461	2	463
Water	481	10	491	509	13	522	507	64	571
Total	2278	1234	3512	2458	1200	3658	2521	1230	3751

*PERSONAL EXPENDITURES

	1976	1975	1974
Administration	\$ 578,773	\$ 600,493	\$ 524,976
Engineering	3,652,800	3,622,717	3,494,219
Highway Eng.	440,217	478,024	492,929
Parks & Parks Eng.	10,852,030	9,829,974	9,114,975
Police	8,500,170	9,008,097	7,826,025
Sewerage	4,928,592	4,958,568	4,549,820
Water	4,973,306	5,301,464	4,891,116
Total	\$33,925,888	\$33,799,337	\$30,894,060

* Includes permanent, temporary and seasonal employees as of June 30.

TOTAL ASSESSMENTS FOR METROPOLITAN DISTRICTS FOR 1975*

<i>Cities and Towns</i>	<i>Metropolitan Water</i>	<i>Metropolitan Parks and Boulevards</i>	<i>Metropolitan Sewerage System</i>	<i>Total</i>
Arlington	\$ 457,736.64	\$ 506,656.50	\$ 456,957.51	\$ 1,421,350.65
Ashland			50,122.22	50,122.22
Bedford			79,965.84	79,965.84
Belmont	227,393.04	355,420.95	220,488.80	803,302.79
Boston	12,700,362.48	3,209,063.46	6,046,945.39	21,956,371.33
Braintree		449,304.84	248,910.20	698,215.04
Brookline	639,793.44	665,349.75	407,896.33	1,713,039.52
Burlington			147,605.55	147,605.55
Cambridge	36,081.60	828,731.47	1,112,687.44	1,977,500.51
Canton	102,230.40	229,010.51	133,875.95	465,116.86
Chelsea	354,779.76	147,638.75	321,983.66	824,402.17
Cohasset		4,759.26		4,759.26
Dedham		333,987.19	247,460.76	581,447.95
Dover		89,234.63		89,234.63
Everett	670,685.76	497,907.01	390,788.44	1,559,381.21
Framingham			361,083.23	361,083.23
Hingham		226,491.87	60,417.13	286,909.00
Hull		90,453.65		90,453.65
Lexington	351,754.32		264,627.73	616,382.05
Lynn		619,256.68		619,256.68
Lynnfield Water District	31,948.56			31,948.56
Malden	662,559.36	478,980.01	484,176.15	1,625,715.52
Marblehead	200,757.12			200,757.12
Medford	691,994.16	503,561.60	620,254.79	1,815,810.55
Melrose	247,140.48	295,724.81	296,585.62	839,450.91
Milton	224,585.28	315,415.11	288,908.82	828,909.21
Nahant	35,788.80	46,071.68		81,860.48
Natick			215,934.06	215,934.06
Needham	81,373.20	439,739.29	239,731.81	760,844.30
Newton	1,086,383.04	1,066,878.01	852,652.36	3,005,913.41
Norwood	387,612.00		218,864.93	606,476.93
Peabody	62,838.96			62,838.96
Quincy	877,142.64	818,778.29	830,243.41	2,526,164.34
Randolph			178,869.49	178,869.49
Reading			131,774.17	131,774.17
Revere	379,241.28	357,352.51	305,950.06	1,042,543.85
Saugus	204,175.20	272,394.72		476,569.92
Somerville	931,485.12	526,314.47	715,926.51	2,173,726.10
Stoneham	307,335.36	221,790.17	169,684.92	698,810.45
Stoughton			130,271.81	130,271.81
Swampscott	137,821.92	79,013.42		216,835.34
Wakefield	211,032.00	260,597.09	191,864.72	663,493.81
Walpole			110,212.78	110,212.78
Waltham	1,009,762.08	656,536.34	436,780.17	2,103,078.59
Watertown	395,224.08	350,769.98	322,735.94	1,068,730.00
Wellesley		410,270.64	186,768.03	597,038.67
Weston	103,215.60	225,390.66		328,606.26
Westwood		205,174.09	97,930.29	303,104.38
Weymouth		539,624.91	392,633.71	932,258.62
Wilmington			102,212.21	102,212.21
Winchester	70,085.52	280,282.48	269,868.41	620,236.41
Winthrop	160,650.48	163,950.67	173,318.23	497,919.38
Woburn			352,821.91	352,821.91
	\$24,040,969.68	\$16,767,877.47	\$18,868,791.49	\$59,677,638.64

* Note: Assessments for 1975 were received in fiscal 1976.

Total Members - 54

- 8 Sewerage – 43

